2018

Ancient Monuments Laboratory
Report 111/91

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Summary

An extensive programme of sampling for charred remains was carried out at the deserted Medieval village of Burton Dassett in south Warickshire. Very little of the charred material was in situ but the pattern of disposal closely matched the pattern of disposal for pottery and other domestic rubbish, suggesting that the charred remains were primarily domestic in origin. Crop species found included bread wheat (Triticum aestivum s.l.), rivet/macaroni wheat (Triticum turgidum/durum) hulled barley (Hordeum vulgare), probably oat (Avena sp.) vetch (Vicia sativa ssp. sativa), beans (Vicia faba and Vicia faba var. minuta) and pea (Pisum sativum). Also found were some chaff fragments of spelt (Triticum spelta) which were determined by accelerated radiocarbon dating to be residual from an earlier (late Roman or early post-Roman) period. Wild plants appeared to be mostly weeds which were probably growing with the crops. Apart from the residual glume wheat remains, chaff fragments were few. The most abundant material was grains of wheat (Triticum sp.), though a few assemblages were dominated by weed seeds.

Author's address :-

L C Moffett

School of Biological Sciences
University of Birmingham
P.O. Box 363
Birmingham
B15 2TT

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Lisa Moffett

Introduction

Peasant villages, the mainstay of the medieval agrarian economy, have hardly ever been investigated for some of the primary artefacts of agriculture, the remains of the crops themselves and their associated weeds. Although a large number of medieval villages have been excavated over the years, very few have been systematically sampled for charred plant remains. Most of the archaeobotanical data from the medieval period in Britain comes from urban sites such as Anglo-Scandinavian York,[1] Winchester,[2] Bristol,[3] Lincoln,[4] Norwich,[5] Newcastle,[6] and London,[7] many of which have rich waterlogged deposits near rivers where organic preservation is extremely good. Much material has also come from cesspits and latrines, which are almost invariably urban or high status[8]. A lesser amount of data comes from other contexts from high status sites such as Reading Abbey[9] and the Bishop's palace at Winchester[10]. Rural sites investigated have tended to be almost anything except villages, such as the moated sites at Birmingham, Cowick and Shackerley,[11] the moated sites and single farmstead at Stanstead,[12] the castle at Nantwich,[13] a grange farm near Oxford,[14] the priory barn at Taunton[15] and a single farmstead at Cefn Graeanog[16]. A few 'one off' samples from medieval villages such as Seacourt,[17] West Whelpington[18] and Thrislington,[19] show that charred material is present on village sites but leave little scope for more general interpretation. The villages at Wharram Percy in Yorkshire, West Cotton in Northamptonshire and Eckweek in Avon have been sampled, and when published these results will be of considerable interest. Although some information about the rural economy can be derived from examination of urban material[20] there are many difficulties associated with this, not least of which is the problem of interpreting complex urban environmental deposits[21].

The settlement at Burton Dassett offered an opportunity to begin to correct this imbalance. Since part of the intention of the botanical investigation was to lay the groundwork for planning any future studies on similar sites in the region, it was decided to sample the site as comprehensively as was practical within the limits of the available resources.

Methods

The aim of the sampling programme was to collect samples from a range of different types of contexts distributed across the site both spatially and temporally. In other words, different types of contexts (i.e. pits, beamslots) were sampled, and similar types of contexts were sampled from different parts of the site and from different phases of the site. There was a particular emphasis on contexts considered to be most likely to contain significant amounts of charred material such as hearths and kilns. Within this framework selection of which particular contexts should be sampled was left to the archaeologist's judgement. Fewer samples were taken from south of the road (Areas J-W) because the excavation had to be carried out in greater haste. Sample sizes in general were between 20 and 25 litres of soil (about 1 1/2 buckets) but some small contexts necessarily produced smaller samples.

Processing the soil samples was extremely difficult. The soil was very heavy, sticky clay and almost impermeable. Simple flotation was out of

the question. The technique of wet sieving a sample through a 1mm mesh before drying and floating the residue to recover the charred material has been used by various archaeobotanists to process the heavy clay soils so typical of many parts of central England. Even this technique, however, was only just barely workable. Samples had to be soaked, often for several days, before they disaggregated sufficiently to be sieved, and even then it was usually necessary to break up lumps of clay by hand despite the potential damage to the charred material.

Other methods were tried. The biotechnicians experimented with soaking the samples in salt and detergent without discernable effect. Even hydrogen peroxide, long used by archaeobotanists to break down clay samples in the lab, was only partly effective. Hydrogen peroxide cannot be used to process large quantities of soil in the field but part of one soil sample was processed as an experiment in the lab. Most clay samples will disaggregate in a 10-20% solution of hydrogen peroxide after an hour or two with occasional stirring. A 10% solution made little impression on the sample even after 24 hours, but the author found that a 50% solution was reasonably effective after 48 hours in disaggregating most of the sample although there were some remaining large clay lumps. It was wholly impractical and prohibitively expensive to attempt to process all of the soil samples in this way. An account given in a paper presented by Andrea Bullock at the spring conference of the Association for Environmental Archaeology in 1987 described how a small cement mixer was used by A. Jones, formerly of the York Environmental Unit, to mix clay soil and water to a slurry which can be easily processed in large quantities, reputedly without damaging the environmental remains. This was tried at Burton Dassett. The clay, however, would not mix with the water in the cement mixer but merely rolled into balls. Ultrasound was effective at disaggregating the clay,[22] but the excavation did not have the resources to buy the equipment or the time to develop this method to be practical for processing large quantities of soil in the field.

Long term soaking of samples, aided by manual breaking up of lumps followed by wet sieving, drying and flotation, was, therefore, the method used, laborious and partly unsatisfactory though it was. An attempt was made to compare recovery by this method with recovery using hydrogen peroxide and recovery using ultrasound but the sample selected for comparison proved to have few charred remains and the comparison had no significance. There was no time or resources for further experimentation. It is not known, therefore, what the limitations of recovery were and whether there was a significant loss of charred material. No signs of significant loss at any rate were observed by eye. If there is a bias resulting from the somewhat rough method of processing at least that bias is consistent and applies to every sample from the site.

After the charred material had been recovered from the soil sample it was dried slowly and bagged. The flots were sorted by biotechnicians under specialist supervision to save specialist time. Identifications were made using a low power binocular microscope and modern reference material was used for comparison. About half of the samples (169 out of a total of 302 taken by criteria described) were analysed. Most of the unanalysed samples contained very little charred material. The samples analysed were chosen first on the basis that those with the most material were the most likely to produce assemblages which could be interpretable. These rich samples were defined as samples which had more than 100 items in the sample and more than 10 items per litre of soil. This eliminated large samples which produced more than 100 items but with a relatively low concentration of material. It was felt that a sparse distribution in the soil might indicate

a greater degree of reworking than a relatively rich concentration which might stand a better chance of having been deposited in a single episode. A lower limit of 100 identifiable items was chosen because percentages on small numbers of items can be misleading. Both of these limits were decided on the basis of personal judgement and are admittedly somewhat arbitrary. These samples containing relatively abundant material were supplemented by others chosen in consultation with the archaeologist to give a reasonably representative spread of feature types within each phase. All hearth samples were also analysed. Although in many cases the samples produced only small numbers of remains, they were analysed because the differences in concentration of remains over different parts of the site at different phases was considered to be of potential interest. The reasons for such intensive analysis were discussed above.

The samples were mainly considered in two ways. One was the composition of the assemblage of material in individual samples, the other was the spatial and temporal distribution of material in the samples across the site. For the purposes of analysing the distribution of material on the site, the relative abundance of material in the samples was important. Abundance was calculated by the number of items per litre of soil. The composition of the samples was calculated simply by the percentage that each component in the sample (i.e. wheat, barley, oat, unidentified cereal, cereal chaff, legumes, weeds, other items) represented. There were 14 samples defined as rich and these are presented in Table A. Most of the discussion in this report, however, is based on a consideration of all the samples analysed. These are given in Table B, along with the numbers of items in each category. The composition of particular samples and the distribution of material is discussed further below. The total list of species found on the site is given in Table C. Detailed species data from all of the samples analysed is given in Table D.

Preservation was only moderate, especially of the large legumes and cereals. Although many cereal grains could not be identified even to genus, there were a sufficient number which were identifiable to give a fairly clear picture of the relative abundance of different cereal species.

Crop plants

The cereals found at the site were rivet/macaroni wheat (Triticum turgidum/durum), bread/club wheat (Triticum aestivum s.l.), hulled barley (Hordeum vulgare L.), oats (Avena sp.), and, somewhat surprisingly, spelt (Triticum spelta). The spelt was later shown by radiocarbon dating to be residual from Roman activity[23]. Wheat was by far the most abundant cereal, with the other cereals being sparsely represented. Rye (cf. Secale cereale) was only doubtfully present in extremely small quantities and there is not sufficient evidence to suggest that it was actually a crop at Burton Dassett. Oats may have occurred only as a component of dredge (a mixture of barley and oats). Peas (Pisum sativum), beans (Vicia faba) and vetch (Vicia sativa ssp. sativa) were also found. These crops are partly reflected in the documentary record. John Reve, a peasant at Gaydon, had nine and a half acres of wheat, ten and a quarter acres of dredge and six acres of peas when he died in 1403[24]. At Lighthorne the demesne harvested sixty acres of wheat, thirty-seven and a half acres of peas, forty-one acres of barley and six acres of oats in 1390-91, while in 1395-6 it harvested fifty-eight acres of wheat, thirty-two acres of peas, forty acres of barley and six acres of oats[25]. Wheat and peas are mentioned in Roger Heritage's probate inventory of the late 15th century from Burton Dassett itself[26]. Vegetable and garden crops such as leeks, cabbages, herbs and flax, were not found among the plant remains at Burton Dassett. Seeds of turnip or wild turnip

(Brassica rapa) were found, but wild turnip is a common arable weed and it is not possible to distinguish wild from cultivated turnip by the seeds. The absence of evidence for vegetable crops is more likely to be due to factors of preservation than a complete absence from the settlement of these smaller-scale but important crops.

Remains of spelt wheat (Triticum spelta) or unidentifiable glume wheat remains (Triticum dicoccum/spelta) were present in 24% of the samples, mostly from Areas A, B, D1 and D2. These remains were primarily glume bases, with a few rachises, spikelet forks and grains, and were mainly present in the samples in very low numbers. Many of the samples containing glume wheat remains were pre-medieval but glume wheat remains persisted in the later samples. One mid/late 15th century sample from D1 (0455/03/1) produced over 200 glume bases - more than half the chaff remains recovered from the whole site.

Spelt was cultivated in the late Bronze Age and Iron Age, becoming particularly prominent during the Roman period. It appears to have gone out of cultivation in Britain shortly after the Saxon colonisation, apart from a few places such as Gloucester[27] and West Stow[28] where it may have continued in cultivation in the Saxon period, at least for a while. Spelt continued to be grown on the Continent. It is mentioned in Carolingian documents[29] and was still grown in parts of Europe in the 20th century[30]. There is no particular reason why spelt should not have been grown in Britain during the medieval period, but so far we have no clear evidence that it was. Spelt was found in medieval contexts at Bierton,[31] but the problems of residuality from Iron Age and Roman occupation which affected the animal bones[32] presumably applies to the plant remains as well. Occasional traces of spelt occur on other medieval sites,[33] but not in convincing circumstances or in any quantity. None of these spelt remains have been radiocarbon dated. Whether the apparent British abandonment of spelt was due to national culinary preferences, or for some other reason it is impossible to say. Since it was possible that the spelt found at Burton Dassett could have been medieval and this would have been an important discovery if it were, a sample was sent to the accelerator radiocarbon lab at Oxford for dating. The dating sample was sent off before the sample containing a large amount of spelt chaff came to light and it was thus necessary to combine chaff remains from several samples to obtain a sufficient sample for dating. Although it is possible the spelt chaff remains may not have all been the same age, it seems unlikely that there would have been a great difference. The resulting date (OxA-2226) suggests that the spelt could not have been contemporary with the medieval settlement at Burton Dassett. If the spelt remains can be assumed to be roughly all the same age then the date (AD 395-650 at 95% confidence), is still interesting in that it represents the period in Britain when spelt was probably declining in importance[34].

The free-threshing wheat is mostly represented by grains which can not be identified to species, but a few reasonably well-preserved rachis nodes were present which could be identified to species. This made it possible to identify two species of wheat, a free-threshing tetraploid (i.e. rivet or macaroni-type wheat) and a free-threshing hexaploid (i.e. a bread wheat type), on the basis of their rachis morphology[35]. Bread/club wheat has been cultivated in Britain since the Neolithic period, although it became relatively more common in the Saxon period when free-threshing wheat replaced the hulled wheats, emmer and spelt. Bread wheat and club wheat cannot be distinguished without the rachis internodes, preferably from a whole ear, and there were none present. The free-threshing tetraploid wheat found at Burton Dassett could be either rivet or macaroni

wheat. These two types of wheat are the same biological species, although they have different ecological requirements and produce grain with different qualities. They cannot be distinguished without the entire rachis length from an ear or whole spikelets,[36] neither of which was found. It is perhaps more likely to be rivet wheat (T. turgidum) than macaroni wheat (T. durum), since there is documentary evidence of rivet wheat[37] from the 16th century and later but apparently no record of macaroni wheat. Free-threshing tetraploid wheat is now known to have been grown in Britain at least since the Norman Conquest[38] although it is possible that it may have been grown earlier.

Bread wheat and rivet wheat have different qualities which make them suitable for different purposes. Bread wheat flour is most suitable for making bread, while rivet wheat flour is more suited to products like biscuits[39]. They may both, however, have been used for bread. Rivet wheat was regarded as being best suited to heavy soils and may therefore often have been planted on clayey soil. It may be that growing rivet wheat was viewed as one way of increasing the area of wheat cultivated, even if the flour obtained was of poorer quality. The actual success of a crop of rivet wheat versus a crop of bread wheat on a very heavy soil probably depends as much on the suitability of a particular variety as on the species. Rivet wheat also has long, strong awns which discourage birds[40] and this may have been a significant factor in the decision to cultivate rivet wheat since bird damage to crops can be severe.

Hulled barley was present in many samples but usually in low quantities. Only in the Area E malting kiln (see below) could it be regarded as abundant relative to wheat, and here it may have been a component of dredge rather than pure barley since there are also a substantial number of oat grains. It does, however, appear to have been a crop in its own right also, since barley grains are not necessarily associated with oat grains elsewhere on the site. In addition to malting, barley was often used as fodder when people could afford to grain-feed animals. Since grain used for fodder is less likely to be exposed to fire than grain prepared for human consumption it may be that the lower numbers of barley grains is reflecting a difference in use rather than a lesser abundance at the site. It may also have been consumed by people but if this was the case, then, assuming it was prepared in the same way as wheat and had the same risk of exposure to fire, it would appear to have been less popular.

Oats are perhaps a more typical crop of upland regions. Documentary evidence from the 14th/15th centuries suggests that oats were never more than one tenth of the crop on demesnes in the Feldon[41]. The oat grains from Burton Dassett could not be identified to species and could well be from wild oat species (Avena fatua or A. sterilis ssp. ludoviciana) which are vigorous and successful crop weeds. Only in the malting kiln were oat grains present in any quantity and here they may be part of a dredge crop, as they are associated with somewhat larger numbers of barley grains.

The identification of rye is not certain and the tenuous evidence makes it seem unlikely that it was a crop here. Rye is tolerant of light droughty soils and seems often to be found on sites near such soils, such as Stafford[42] and several places in East Anglia,[43] although Green[44] has cautioned against making too simplistic assumptions about the relationships between types of soils and the crops cultivated on them. Rye has poorer bread-making qualities than wheat and may have been generally regarded as a less desirable crop. It may not have been much cultivated where there were heavier soils, such as those at Burton Dassett, which would be better suited to wheat.

Three other field crops also found at Burton Dassett were field bean (Vicia faba), pea (Pisum sativum) and cultivated vetch (Vicia sativa ssp. sativa). Legumes are present in 61% of the samples and comprise 4% of the total number of botanical items from the site. This percentage of the total material may sound small, but legumes are often considered to be under-represented on archaeological sites relative to cereal grains[45]. The relative frequency in the samples seems high and suggests that legumes were common, even if infrequently exposed to fire.

Beans and peas were staple medieval foods but vetch is less palatable and usually eaten by humans only in times of famine. It was cultivated in medieval Britain exclusively as a fodder crop. The cultivation of vetch seems to have varied regionally. Vetch was cultivated in the 13th to 14th centuries mainly in the southeast of England according to documentary sources although there were occurrences in the northwest midlands[46]. The only documentary record of vetch from Warwickshire is from Knowle in the north of the county[47]. The adoption of vetch generally seems to have been hesitant and experimental, though great quantities were grown in Kent[48]. Peasants, however, may have grown vetch more frequently than wealthy landowners because it was a cheap alternative to oats as fodder for horses, which were being more widely used as traction animals by the peasantry[49]. Vetch occurs from the 13th century through the late 15th century at Burton Dassett. Like many other legumes, is nitrogen-fixing and may have been cultivated in a system of crop rotation to improve the soil.

Doubt has been cast on whether the advantages of legumes in improving the soil fertility were known, since there is no mention of it in medieval treatises on husbandry such as Walter of Henley[50]. The fertilising properties of legumes were well known to the Romans, and Columella even states that the greatest enrichment is from the roots (where the nitrogen-fixing bacteria live), which should be ploughed back into the soil[51]. It seems unlikely that this knowledge would have been completely lost, especially since it could easily be rediscovered from practical experience. There is evidence that the cultivation of vetches, in addition to fertilising with manure, lime, marl and the folding of sheep, seems to have increased production by making it possible to eliminate fallow in parts of Kent and Norfolk[52]. It seems unlikely that this could have been done without knowledge of the properties of legumes for soil improvement.

Wild plants

Most of the wild species found were probably crop weeds although many of these species also grow in disturbed habitats, such as gardens and roadsides, or in grassland. Some may have been collected and brought to the site for use as building materials, bedding or animal food. Weeds constitute about 22% of all the items found on site although they are present in some samples in considerably higher percentages. Some of the weeds, such as corn buttercup (Ranunculus arvensis), corn cockle (Agrostemma githago), yellow vetchling (cf. Lathyrus aphaca), stinking mayweed (Anthemis cotula), cornflower (Centaurea cyanus) and darnel (Lolium temulentum) are rare in the British flora today and hare's ear (Bupleurum rotundifolium) is regarded as extinct[53].

A number of the weeds are species often associated with calcareous soils. Shepherd's needle (Scandix pecten-veneris) and hare's ear are plants mainly of fairly fertile calcareous soils, while corn buttercup and bristly oxtongue (Picris echioides) can be found on somewhat poorer soils[54]. Bristly ox-tongue is found especially on stiff calcareous soils, and its present-day distribution in Warwickshire is concentrated mainly on the Lower Lias

limestone and clay of the southwest[55]. Yellow vetchling also seems to be found more on calcareous soils, while small-flowered buttercup (Ranunculus parviflorus) and cornflower are plants found mainly on light, dry, but not necessarily calcareous, soils. Other plants such as wild radish (Raphanus raphanistrum) and sheep's sorrel (Rumex acetosella agg.) are typical of acid soils. Stinking mayweed (Anthemis cotula) is a plant of heavy, non-calcareous soils. It seems possible from this assemblage that both calcareous and non-calcareous soils, and light and heavy soils were being cultivated. This would seem to accord moderately well with the modern soils found in the vicinity, though perhaps not necessarily those actually worked by the inhabitants of the settlement.

Some plants now associated mainly with grassland but which still grow in crop fields and which were probably crop weeds at Burton Dassett are rattle (Rhinanthus sp.), black medick (Medicago lupulina) and clover or a closely related species (Trifolium type). Meadow vetchling (Lathyrus pratensis) is recorded mainly from waste ground and grassland in modern Warwickshire, while the tares (Vicia hirsuta, V. tetrasperma, and cf. V. tenuissima) seem to be found equally in grassland and cultivated ground[56]. It is possible that fallowing, or the application of manure containing trampled uneaten hay, may have encouraged some of these plants to grow in crop fields.

Ruderal species such as wild radish, fat hen (Chenopodium sp.), orache (Atriplex sp.), knotgrass (Polygonum aviculare agg.) and ivy-leaved speedwell (Veronica hederifolia) are common plants which could have grown in gardens, along path edges, or in any disturbed ground habitat which was not heavily trampled, as well as in the crop fields.

Henbane (Hyoscyamus niger) is a nitrophilous plant, now rare, of waste ground and farmyards. It was said by Gerard, the 16th century herbalist, to be frequently found on dung heaps[57]. It is not today regarded as an arable weed but perhaps manuring could have been responsible for its possible presence in a crop field. Alternatively, it may have grown somewhere else, a garden perhaps, and been burned as rubbish. Hemlock (Conium maculatum) could also have grown in gardens or other waste ground. Both plants would probably have been discouraged if they had grown abundantly in the crops as they are highly poisonous in all parts, including the seeds[58]. Henbane and hemlock might also have been collected deliberately for medicinal purposes, but their mere presence is not an indication of this as they were probably very common inhabitants in the disturbed vicinities of medieval settlements.

A few damp/wet ground plants are present. Spikerush (Eleocharis palustris/uniglumis) is a rhizomatous plant which grows in ground that is wet for at least part of the year[59]. Although normally a plant of damp grassland in modern Britain, its association with charred cereal remains is so consistent[60] that it seems probable it invaded poorly drained arable fields with considerable regularity[61]. Many species of sedge also grow in wet or damp ground but there are species which do not and it was not possible to identify which sedges were present at Burton Dassett. Marsh bedstraw (Galium palustre agg.) and bur-reed (Sparganium sp.) are plants of permanently waterlogged soils where crops could not have grown. They may have been collected with plants gathered for thatch or bedding, and this may be true of the sedges also.

Heather (Calluna vulgaris), represented by one immature flower, and dyer's greenweed/gorse (Genista/Ulex type), may also have been used for bedding or thatch. Neither dyer's greenweed nor gorse are very common in south Warwickshire today and heather is virtually absent[62]. Perhaps these plants grew locally in the medieval period but it is more likely that they

were brought in from elsewhere, possibly the north of the county.

A couple of fragments of fruitstone which could have been sloe, bullace, damson or cherry (Prunus sp.) and one fragment of hazel (Corylus avellana) are the only evidence of trees or shrubs typical of hedges and woodland edges. Fruits and nuts were undoubtedly collected for food and cuttings from trimming hedges and trees may also have been used as firewood.

Sample composition and possible biases in preservation

Processing a harvested crop into a final product of cleaned grain ready to be prepared for food can only be efficiently achieved in a limited number of ways. Although the tools used for these tasks may vary, the stages of processing and the sequence in which they are performed are fixed by the demands of the crop. The resulting products and by-products from each stage of processing are essentially similar regardless of the tools used. The archaeobotanical interpretation, therefore, of crop assemblages derived from the various stages of processing is not dependent on exact knowledge of the tools and methods used[63].

Ethnographic studies of modern traditional societies[64] suggest that free-threshing cereals, like bread wheat and rivet wheat, were traditionally processed in several stages. After harvesting, the crop was threshed to make the grain fall out of the ears and then winnowed to separate the straw, weed stems, light chaff and weed seeds from the grain. Many contaminants are left after winnowing, such as small pieces of straw, fragments of chaff, seed heads and heavier weed seeds. The most efficient means of removing these is by sieving. Sieving has to be done at least twice, once with a coarse riddle which allows the grains to fall through while retaining the large contaminants, such as pieces of straw and large seed heads, and once with a fine sieve with holes just small enough to retain the grains while allowing most of the contaminants smaller than grains, which would include most of the remaining weed seeds, to fall through. In practice there may need to be several winnowing and sieving stages before most of the contaminants are removed. A final stage of hand sorting can be done to remove the grain-sized contaminants, e.g. large weed seeds like corncockle, a few remaining chaff fragments and pieces of grit[65]. Judging by the apparently widespread contamination of bread by harmful corncockle seeds[66] it would seem that this last stage was often omitted.

Common oats and hulled barley have their grains tightly enclosed by the inner chaff parts (the lemma and palea) which simple threshing does not remove. They need further processing if they are to be used as food for humans and this processing would be done after the grain had been threshed, winnowed and sieved. In northern parts at least, of the British Isles oats and barley were traditionally parched to make the chaff brittle and then pounded in a mortar with a mallet or pestle to free the grain. This process was known as hummelling[67]. The grain would then have to be winnowed and sieved again to remove the chaff. The waste from these stages is not generally identified in archaeobotanical samples because the lemmas and paleas of oats and barley are thin and papery, and seldom survive charring once they are detached from the grain.

Threshing and winnowing produce huge amounts of waste when the harvest is processed, yet apart from the anomalous sample containing residual Roman/post Roman glume wheat chaff from a ditch in Area D1 (context 455/3/1), there are very few remains of cereal chaff or straw. The absence of straw and chaff remains is sometimes used to suggest that the crop arrived on a site already fully cleaned and processed and therefore had not been grown at the site. In fact, the presence or absence of

threshing and winnowing waste may be a poor indication of the site's economy[68]. Material probably derived from these stages is sometimes found in abundance on urban sites such as Oxford,[69] Stafford[70] and Aylesbury,[71] presumably having been brought in for animal bedding and fodder, possibly for fuel and other purposes. Rural medieval sites are too poorly studied for any comparison, but analogy with rural Iron Age and Roman sites suggests that the by-products of the early stages of crop processing (i.e. the threshing and winnowing waste) are often not found on the sites which produced the crops and at which these stages of processing must have been performed. This may be because these by-products were valued and kept protected from fire. In addition to bedding, fuel and fodder, these by-products can also be used for building materials and to temper pottery. It may be that these were more important uses of these materials than fuel. Alternatively it may have been more economical sometimes to sell the crop processing by-products. Either way there would be little charred evidence to find.

It is possible that differential preservation has biased the survival of the charred plant remains in favour of grains. This could possibly account for the lack of primary crop processing remains. Experiments have shown the grains survive charring much better than chaff fragments[72]. Long pieces of straw and the rachises of free-threshing cereals such as bread and rivet wheat which remain joined together are particularly vulnerable as they tend to get caught in the upper parts of the fire where they are completely consumed. Only the dense, heavy items are likely to sink to the lower parts of the fire where reducing conditions prevail and where they are likely to become preserved by charring[73]). The bias against straw and chaff relative to grains may be very considerable, and if this is the case then there may have been much more burning of crop processing by-products than is apparent from the surviving remains.

The largest categories of material from most samples were wheat grains and indeterminate cereal grains, the latter presumably mostly wheat also. Only one sample was dominated by chaff and this was spelt chaff found anomalously in a 15th century ditch (455/03/1) and presumed to be residual from the pre-medieval phase. Although most samples contained some weed seeds, weeds rarely predominated in a sample. There were some exceptions, however. In some samples weeds were between 30% and 50% of all the items in the sample and in two samples weeds predominated. These moderately weedy (30%-50%) to very weedy (>50%) samples were mostly from Areas H, I, and K, although two moderately weedy samples came from Area D2. It is possible that these weed seeds represent crop processing waste despite the scarcity of chaff, for the reasons of differential preservation discussed above. Cereal grains still predominate in the moderately weedy samples and are a significant percentage of even the two samples strongly dominated by weed seeds. Interpretation is very difficult since these assemblages may represent post-depositional mixing of different assemblages, mixing of material from different crop products during charring, or could be the result of differential survival in a fire.

There were 14 samples defined as rich (see methods section above). Most of these samples were also comprised predominantly of wheat and indeterminate cereal. The exceptions were the malting kiln (1378), the ditch fill with abundant spelt chaff (455/03/1) and the two very weedy samples from H2 (2443/01/1) and I2 (2370/01/1). It was also noticeable that two samples in particular (1214/00/1 from D26 and 2082/01/1 from J4) contained comparatively high percentages of legumes (12% and 19% respectively).

The Area E malting kiln

Roughly one quarter of the items in the malting kiln were weed seeds, of which the majority were Brassica cf. rapa or B. rapa/nigra (turnip or turnip/black mustard). Seeds of this species appear in other contexts but this is the only feature where they are abundant. This may well be fortuitous, but it is just possible that the plant was being utilised. As noted earlier, seeds of cultivated B. rapa cannot be distinguished from seeds of the wild plant. The cereals were a mix of barley, oats and wheat, with barley being the most abundant and wheat the least abundant. As noted above, the barley and oats could either have been grown separately or together as dredge. Well over half the barley grains could be seen to have germinated but only a few of the oat grains could be definitely identified as germinated. The rest were too poorly preserved to be able to tell. This assemblage is probably partly the result of accidental charring of malt during the roasting process. The wheat grains, however, appear not to have germinated, suggesting that possibly the kiln was used for drying or parching grain as well as for curing malt.

Possible sources of the charred material

There is no clear evidence for where the plant material became charred. The majority of sampled contexts were from features such as ditches, pits, layers and hollows where the charred material had not been burned in situ. The hearths and the malting kiln seem the most likely places where the plant material could have become charred, but the samples from these contexts offer no confirmation of this. Other sources of charred material may not have been within the area of excavation. It is not known how far charred material may have been transported from the place where it originally became charred. In most cases this may not have been very far, but gathering up and dumping of rubbish containing charred material could have severed any detectable spatial relationship between the source and where the charred material was actually found.

The Area E malting kiln could potentially be a source of charred material resulting from the burning of crop waste as well as accidental destruction of the malt. Some post-medieval writers state that straw was preferable to wood for malt roasting as it did not smoke and taint the ale[74]. There is some evidence from charred remains from sites such as Dean Court Farm, near Oxford, and Stafford[75] which suggest that crop processing by-products or even rakings from the fields may have been used for fuel in malting kilns and bread ovens. At Burton Dassett there is hardly any chaff or straw in the malting kiln though the substantial number of weed seeds might be the remains of fuel. The malting kiln, however is in Area E, in the northern area of excavation and away from the weediest samples in the southern area. It seems unlikely to have been the source of material in these samples and indeed its use post-dates some of them. The cereal assemblage is also different from all other samples from the site in that it is mainly comprised of barley and oats. The malting kiln, therefore may have contributed very little to the charred remains on the rest of the site.

The hearths were not particularly productive of charred remains and indeed some contained hardly any. The composition of hearth samples was indistinguishable from that of the majority of other samples. Wheat and unidentified cereal grains usually predominate, with a few legumes, other cereals and weed seeds. The average number of items per litre of soil in the hearths was only slightly higher than the average, 5.3 as opposed to a mean average of 4.4 for the whole site (excluding pre-medieval samples). Only one of the samples defined as rich was from a hearth. This may have

been at least partly because of their construction, which was generally just a stone platform supporting an open fire, without any containing structure[76]. This kind of hearth would probably not be conducive to the survival of the plant remains, as a large proportion of the fire would be aerobic, causing the organic material to burn away rather than char. The hearths may also have been cleaned out fairly regularly. Cleaning of hearths could account for the accumulation of charred material in other features as a result of rubbish deposition. The amount of material accumulated in these deposits, however, does not seem very great, especially when one considers the amount of cereal grain that must have been consumed in the village. In terms of numbers of cereal grains needed to feed each household the amount would be vast, yet charred grains accumulated in the pits, ditches, etc. in relatively minute quantities. This suggests that the risk of cereal grains becoming charred was probably very low. What charred material there was on site was concentrated around the buildings, however, and correlates closely with the distribution of other domestic rubbish. This makes it seem likely that the hearths were the source of much of the charred material.

If the hearths were the main source of the charred material how did whole cereal grains come to be charred in the first place? Cooking whole cereal grains as groats is a common way of consuming cereals but bread wheat and rivet wheat in general are not particularly well suited to this, although the suitability is perhaps a matter of opinion. The medieval diet, however, was based not on groats but on pottage, of which cereals were the basis[77]. Coarsely ground grain was boiled and peas, beans and other items could be added. Bread, of course, was also eaten. In either case the grain would have to be ground. Grain could have become charred if it was being parched in preparation for grinding. Experiments with Romano-British quernstones show that grain mills far more efficiently in such querns if it is parched first[78]. Medieval hand mills such as were used in private households, though somewhat different in form, were not very different from Romano-British querns in operation and would undoubtedly also have been more efficient if the grain to be ground was first hardened by parching. Parching is also said to improve the flavour. Although most of the grain probably went to the mill to be ground, it is probable that some people ground at least some of their grain at home. Free peasants were allowed to grind their grain where they pleased but unfree tenants were obliged to take their corn to the lord's mill, though this relaxed in the late 14th and 15th centuries as seigneurial power waned[79]. The presence of used querns, common in medieval villages, suggests that the suit of mill must often have been unenforceable. If the grain was ground in small batches as needed then the household hearth was probably the obvious place to parch the grain beforehand. Care would be taken not to spill or burn the grain and indeed the temperature needed to dry the grain hard would be very low. The grain might have been kept some distance above the fire or the fire kept very low. The probability of large quantities of grain becoming charred in this way is very small but it would be inevitable for a few to spill into the hearth and become charred. Beans and peas could perhaps have become charred by small spillages during food preparation.

Since many of the weeds are species likely to have grown in the crop fields it seems probable that most of the weed seeds are derived from arable products or waste. Possibly some households were using crop processing waste to light fires. Despite the few weedy samples discussed above, the evidence does not suggest very large numbers of weed seeds being burned as they presumably would be if the hearths were burning crop processing waste for fuel. One would also expect that there would be at

least a few more straw nodes surviving if large numbers were being burned. Another possibility is that the weed seeds were the result of hand-cleaning the grain. Many of the weeds found are of fairly large, heavy seeds which might have been difficult to remove from the grain in any other way. Although not all of the weed seeds are large, some of them could have been still attached to seed heads or contained in pods and capsules, which are less dense in structure and may be more readily destroyed in a fire than the seeds themselves. In fact a Leguminosae pod fragment and a calyx tip of corncockle (Agrostemma githago) were found, and perhaps these kinds of items were present more abundantly than can be seen from the surviving charred remains. The hearths in the vicinity of the weedy samples, however, contain few weed seeds, and only one hearth from the whole site (1659/03/1 from E5) produced possibly significant numbers of weed seeds. The hearths, therefore, provide no evidence that these activities were in fact taking place.

Spatial distribution and change through time

The location of the samples taken and the relative abundance of the charred material in the samples analysed can be seen in Fig. 1. The greater intensity of sampling north of the road is obvious but otherwise the main pattern that emerges is that the charred material tends to be more concentrated around the houses. This is some confirmation that the charred material is domestic in origin as suggested above. Areas D2 and E seem to have produced the most material. The house from D2 in particular seems to show a concentration of remains. This is partly because there is also a concentration of samples taken, but a similar concentration of samples taken in the house in area F produced very little.

There is very little sign of change in the plant remains during the occupation of the site. Apart from the obvious difference between the pre-medieval material and the material associated with the medieval settlement, there is no detectable change in species present. The composition of the assemblages remains generally consistent, with no changes which appear to be associated with a change in time. At first it seemed as if there might be a slight change in the abundance of plant material, since the average number of items per litre declines through the general site phases steadily from 4.9 in the early 13th century to 3.8 in the later 15th. A standard regression analysis, however, showed this to be statistically insignificant.

The distribution of glume wheat (emmer/spelt and spelt) remains was plotted and showed that these remains were confined to the north of the road except for two samples. This is in accordance with the distribution of Roman pottery.

Distributions were also plotted for the relative abundance of cereal grains and weed seeds and showed an apparent abundance of cereal grains north of the road. This could be spurious as cereal grains are the most common item from the site and this is where most of the samples are from. The only difference which seems significant is in the distribution of weedy samples. There were more weedy samples from the area south of the road (eight samples) than from north of the road (two samples), and given the much lesser number of samples from the south this difference is probably real. There is no detectable relationship with the date, since both areas of the settlement are contemporary for most of their period of occupation, and weedy samples are found from the early-mid 13th century to the late 15th. As suggested above, the weedy material could be the result of using crop waste to light household fires or of crop cleaning. It could possibly also be the result of burning garden rubbish, though why any of these

should have been more popular activities south of the road is difficult to explain.

Conclusion

The crop remains found at Burton Dassett corroborate what is known from the documentary evidence about the types of crops grown in the area. The archaeobotanical evidence also adds two crops, beans and vetch, not mentioned in the documents, and shows that two different species of wheat were grown, something which cannot seen from documentary evidence. It is not possible to tell from the plant remains if any of the cereals were grown for animal fodder, but vetch almost certainly was. It seems highly likely that the legume crops were part of a system of crop rotation which would have helped to maintain soil fertility.

Much of the discussion in this report has been based on the assumption that the most likely place for the plant remains to have become charred is in domestic hearths. This assumption is not necessarily valid and it has been pointed out that there is little evidence for this from the hearths themselves. It is difficult to postulate convincing alternative theories however. No bread ovens or other drying ovens were found and the one malting kiln which produced charred remains is not only 15th century and therefore later than much of the charred remains, but also produced a different assemblage from anywhere else on the site.

Continuing the tenuous chain of deduction, possible kinds of material were suggested which could have become charred in domestic hearths, such as crop cleaning waste being use as tinder or fuel, grain being parched prior to grinding, hand cleaning of grain and minor cooking spillages. The use of crop waste as tinder and/or fuel must surely have taken place since in a society with little waste paper straw would have been the handiest available material. Remains of straw, however, are conspicuous by their absence. Except for a few samples, charred weed seeds are also much fewer than one might expect to result from substantial burning of crop waste.

The presence of querns suggests that at least some grain was ground at home and therefore the parching of grain to facilitate hand-milling is also probable. Cereal grains, however, survive charring better than straw/chaff material and many weed seeds. It is difficult, therefore, to know if a predominance of grains is indicative of possible parching activities or indicates the minority survivors from handfuls of crop waste. Further experimentation might help to resolve some of these problems. Extensive sampling of other rural settlements is also needed to provide comparisons which may also help to clarify patterns of distribution and use of plant material. Only when the taphonomic factors are better understood will it be possible to bring the botanical evidence to bear more on more complex questions of economic significance.

Acknowledgements

I am grateful to Wendy Carruthers and Peter Murphy for allowing me to refer to their unpublished work and to Dr. C. Dyer for historical references and information. The botanical work was funded by English Heritage.

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TABLE A: BURTON DASSETT RICH SAMPLES

WITH >10 ITEMS PER LITRE AND >100 TOTAL ITEMS IN SAMPLE

PHASE	CONTEXT NO.	PER LITRE	TOTAL ITEMS	CONTEXT TYPE	% WHEAT	% BARLEY	% RYE/OAT	% CEREAL	% CHAFF	% LEGUMES	% WEEDS	% OTHER
D15	0455/03/1	21.64	238.00	DITCH/GULLY	2.52	0.00	0.00	4.20	89.08	0.00	4.20	0.00
D15	0930/05/1	17.76	444.00	DITCH/GULLY	28.15	2.03	0.00	61.26	3.83	1.35	3.15	0.23
D26	1199/00/1	10.93	164.00	HEARTH	34.15	8.54	0.00	46.95	0.00	0.61	9.76	0.00
D26	1214/00/1	18.60	465.00	LAYER	35.48	7.74	0.43	31.40	0.43	11.83	12.26	0.43
D23	1560/01/1	38.16	954.00	HOLLOW FILL	60.90	0.00	0.00	36.27	0.00	0.31	2.52	0.00
E4	1123/01/1	22.78	205.00	HEARTH	27.80	0.49	0.00	58.05	0.49	6.83	5.85	0.49
E6	1143/00/1	13.56	339.00	FLOOR SURFACE	38.05	3.54	0.29	39.53	0.00	5.01	12.98	0.59
E5	1149/01/1	13.56	339.00	HOLLOW	46.90	5.90	0.00	41.30	0.00	0.88	5.01	0.00
E5	1378/00/1	17.76	444.00	MALTING KILN	8.33	14.64	11.71	38.96	0.00	0.45	25.90	0.00
E5	1378/00/2	44.96	281.00	MALTING KILN	9.61	13.17	11.03	40.93	0.71	0.71	22.42	1.42
H2	2443/01/1	25.80	645.00	DRAIN	10.70	0.78	0.31	12.56	0.00	0.62	74.88	0.16
I2	2370/01/1	11.36	284.00	HOLLOW FILL	19.01	1.41	0.35	10.21	0.00	1.06	67.96	0.00
J4	2082/01/1	15.00	150.00	HOLLOW FILL	25.33	6.00	5.33	24.67	1.33	18.67	18.67	0.00
K4	2317/00/2	13.28	332.00	MIDDEN LAYER	36.14	1.51	0.30	32.23	0.00	1.20	28.61	0.00

SITE	PHASE	CONTEXT	CONTEXT TYPE	IPL	WHEAT	BARLEY	OATS	CEREAL	CHAFF	LEGUMES	WEEDS	OTHER	TOTAL
BD86	A1	0079/01/1	PIT FILL	5	90	2	0	40	0	2	5	0	139
BD86	A1	0093/01/1	GULLY/DITCH FILL	<1	0	0	0	1	2	0	0	0	3
BD86	A1	0097/01/1	PIT FILL	<1	0	0	0	0	1	0	0	0	1
BD86	A1	0113/01/1	DITCH FILL	<1	0	0	0	0	3	0	0	0	3
BD86	A1	0164/01/1	GULLY FILL	<1	0	0	0	1	1	0	0	0	2
BD86	A1	0169/01/1	PIT FILL	<1	1	0	0	2	1	0	0	0	4
BD86	A1	0252/01/1	POSTHOLE/PIT FILL	<1	3	0	0	3	0	0	1	0	7
BD86	A1	0300/01/1	PIT FILL	<1	0	0	0	0	3	0	0	1	4
BD86	B1	0191/01/1	PIT/DITCH FILL	<1	0	0	0	0	1	0	5	0	6
BD86	B1	0195/01/1	PIT?/FILL	<1	0	0	0	1	0	0	0	0	1
BD86	B1	0200/01/1	PIT FILL	<1	0	0	0	0	0	0	0	1	1
BD86	B1	0373/01/1	GULLY FILL	<1	0	0	0	0	7	0	0	0	7
BD86	B1	0377/01/1	GULLY FILL	<1	0	0	0	1	6	0	1	0	8
BD86	B1	0398/01/1	PIT FILL	<1	0	0	0	1	4	0	2	1	8
BD86	B1	0419/02/1	GULLY/HOLLOW FILL	<1	0	0	0	0	5	0	1	0	6
BD86	B1	0679/01/1	PIT FILL	<1	0	0	0	0	10	0	0	0	10
BD86	B1	0714/01/1	HOLLOW FILL	<1	2	0	0	0	2	0	3	0	7
BD86	B1	0734/01/1	GULLY FILL	<1	0	0	0	0	5	0	0	0	5
BD86	B1	0739/01/1	DITCH FILL	<1	0	0	0	0	5	0	1	1	7
BD86	B1	0773/01/1	PIT	<1	1	0	0	0	5	0	0	1	7
BD86	D21	1799/01/1	PIT/HOLLOW FILL	<1	0	0	0	1	0	0	0	0	1
BD86	E1	1767/01/1	PIT FILL	<1	0	0	0	1	0	0	0	0	1
BD86	G1	1955/01/1	PIT FILL	<1	0	0	0	0	1	0	1	0	2
BD86	G1	1983/01/1	PIT FILL	<1	0	0	0	1	0	0	0	0	1
BD88	H1	2432/00/1	PIT/DITCH FILL	3	17	0	0	10	2	3	33	0	65
BD88	K1	2428/00/1	LAYER	7	40	1	3	54	1	1	74	2	176
BD88	K1	2463/01/1	DITCH FILL	6	57	0	0	45	0	5	34	2	143
BD88	K1	2472/01/1	DITCH FILL	5	27	0	2	25	0	7	55	0	116
BD88	H2	2318/01/1	HOLLOW FILL	9	92	3	0	76	0	1	58	0	230
BD86	H2	2443/01/1	HOLLOW FILL/LAYER	26	69	5	2	81	0	4	483	1	645
BD88	I2	2309/00/1	LAYER	10	79	1	0	85	1	5	76	1	248
BD88	I2	2370/01/1	HOLLOW FILL	11	54	4	1	29	0	3	193	0	284
BD88	I2	2389/01/1	POSTHOLE FILL	3	20	0	0	27	0	2	17	1	67
BD88	J2	2154/01/1	DITCH FILL	1	7	0	1	4	0	3	13	1	29
BD88	K2	2438/00/1	RUBBLE SURFACE	1	5	1	0	16	0	1	10	0	33
BD86	A2	0059/01/1	PIT FILL	<1	0	0	0	0	0	0	0	1	1
BD86	A2	0060/01/1	PIT FILL	4	56	1	0	23	0	4	8	0	92
BD86	A2	0064/01/1	PIT FILL	<1	3	0	0	2	0	0	1	0	6
BD86	A2	0106/01/1	HEARTH FILL	2	23	1	0	7	0	6	5	0	42
BD86	A2	0168/01/1	GULLY/PIT FILL	3	40	4	0	24	0	2	1	1	72
BD86	A2	0242/01/1	PIT FILL	2	13	1	0	8	9	0	5	2	38
BD86	D12	0478/01/1	PIT FILL	<1	1	0	0	2	0	0	0	0	3
BD86	F2	1427/01/1	HOLLOW FILL	<1	0	0	0	1	0	0	1	1	3
BD86	E3	1298/00/1	LAYER	<1	0	0	0	0	0	1	2	0	3
BD86	E3	1404/00/1	LAYER	<1	1	0	0	1	0	0	0	0	2
BD88	E3	1661/00/1	HOLLOW FILL =841	<1	5	3	0	0	0	6	4	0	18
BD86	E3	1888/00/1	LAYER	1	2	5	4	8	1	1	4	1	26
BD86	F3	1301/00/1	LAYER	<1	3	1	0	4	2	1	1	1	13
BD86	F3	1326/00/1	LAYER	<1	4	0	0	5	1	1	7	0	18
BD88	H3	2384/00/1	LAYER	6	25	1	0	38	2	1	80	1	148
BD88	K3	2387/01/1	BURNT PATCH FILL	1	0	0	0	2	0	0	3	0	5
BD88	K3	2488/00/1	LAYER	12	25	0	2	23	0	8	28	0	86
BD86	D13	0447/01/1	HOLLOW FILL	4	55	5	0	34	1	1	4	0	100
BD86	D13	0629/01/1	HOLLOW	<1	3	0	0	8	0	0	8	0	19
BD86	D13	0631/01/1	HOLLOW FILL	<1	6	0	0	3	1	0	3	0	13
BD86	E4	0998/01/1	DRAIN FILL	<1	3	0	0	2	0	0	3	0	8

SITE	PHASE	CONTEXT	CONTEXT TYPE	IPL	WHEAT	BARLEY	OATS	CEREAL	CHAFF	LEGUMES	WEEDS	OTHER	TOTAL
BD86	E4	0999/01/1	BURNT PATCH MATRIX	<1	1	0	0	2	0	2	2	0	7
BD86	E4	1123/01/1	BURNT ASHY MATRIX	23	57	1	0	119	1	14	12	1	205
BD86	E4	1191/01/1	BURNT PATCH MATRIX	<1	3	0	0	6	0	1	4	0	14
BD86	E4	1241/00/1	LAYER	<1	6	0	0	10	0	0	2	0	18
BD88	H4	2133/00/1	LAYER	1	12	1	0	10	0	1	3	0	27
BD88	H4	2137/00/1	LAYER	5	52	6	0	38	0	7	28	1	132
BD88	H4	2377/00/1	FLOOR LAYER?	2	23	0	0	15	1	2	17	0	58
BD88	K4	2317/00/1	LAYER	9	94	6	1	65	0	16	39	0	221
BD88	K4	2317/00/2	LAYER	13	120	5	1	107	0	4	95	0	332
BD88	K4	2357/00/1	RUBBLE SURFACE	1	10	1	0	8	0	1	17	0	37
BD88	K4	2368/00/1	LAYER	5	24	4	0	34	0	15	48	0	125
BD88	K4	2445/00/1	FLOOR LAYER	9	112	1	0	73	0	1	36	1	224
BD86	A3	0047/01/1	PIT FILL	1	21	2	0	8	15	2	5	1	54
BD86	A3	0084/01/1	PIT FILL	<1	2	1	0	2	4	2	0	0	11
BD86	A3	0221/01/1	HOLLOW FILL	4	35	4	0	59	0	1	4	3	106
BD86	A3	0248/01/1	GULLY FILL	<1	3	0	0	5	0	0	2	0	10
BD86	D23	1560/01/1	HOLLOW FILL	38	581	0	0	346	0	3	24	0	954
BD88	J3	2107/0/13	RUBBISH LAYER ?NO.	6	47	4	0	69	0	11	13	0	144
BD88	J3	2211/0/19	FLOOR LAYER	<1	7	0	0	5	0	0	11	0	23
BD86	A4	0140/01/1	DITCH FILL	<1	2	1	0	2	0	0	2	0	7
BD86	A4	0255/02/1	DITCH FILL	<1	5	0	0	0	0	0	0	0	5
BD86	A4	0285/01/1	DITCH FILL	<1	11	1	1	6	0	1	3	0	23
BD88	H6	2378/01/1	GULLY FILL	2	17	2	0	10	1	5	15	0	50
BD88	J5	2050/03/1	DITCH FILL	<1	3	0	0	2	0	0	5	0	10
BD88	J4	2082/01/1	HOLLOW FILL	15	38	9	8	37	2	28	28	0	150
BD88	J5	2165/02/3	DITCH FILL	<1	4	0	0	4	3	0	2	0	13
BD88	J5	2165/05/3	DITCH FILL	1	10	1	0	6	1	1	6	0	25
BD88	J5	2168/00/7	SLAG LAYER	<1	1	0	0	1	0	1	2	0	5
BD88	J4	2204/0/31	FLOOR LAYER	<1	2	0	0	2	0	1	2	0	7
BD88	J4	2205/00/5	FLOOR LAYER	<1	10	0	0	2	0	0	0	0	12
BD86	D14	0514/01/1	BURNING LAYER	3	9	7	0	11	2	0	22	0	51
BD86	D14	0574/01/2	DITCH FILL	5	58	1	0	47	0	0	9	0	115
BD86	D14	0598/01/1	POSTHOLE PACKING	<1	7	3	0	0	0	0	1	0	11
BD86	D14	0615/01/1	HOLLOW FILL	2	22	2	0	10	0	2	4	0	40
BD86	D24	0657/01/1	HEARTH	12	6	0	0	3	0	0	3	0	12
BD86	D24	1200/00/2	FLOOR LAYER	2	13	2	0	25	0	1	20	0	61
BD86	D24	1201/01/1	BURNT PATCH	2	4	1	0	6	0	0	14	1	26
BD86	D24	1230/00/1	ASHY LAYER	6	80	5	1	35	0	11	20	1	153
BD86	D24	1275/01/1	ASHY PATCH FILL	6	21	13	2	57	0	0	68	0	161
BD86	D24	1289/00/1	FLOOR LAYER	3	23	0	4	16	0	4	18	1	66
BD86	D24	1315/01/1	HEARTH FILL	2	8	9	0	11	0	1	0	0	29
BD86	D24	1475/01/1	ASHY PATCH	3	10	5	0	21	0	4	38	0	78
BD86	D24	1479/01/1	HEARTH FILL	3	19	4	0	27	0	15	13	0	78
BD86	D24	1543/01/1	HOLLOW FILL	2	7	2	1	12	0	2	18	0	42
BD86	D24	1548/04/1	LAYER/DITCH FILL	<1	6	0	0	3	0	0	2	0	11
BD86	F4	1164/00/1	FLOOR LAYER	<1	3	0	0	1	0	0	1	0	5
BD86	F4	1239/00/1	FLOOR LAYER	<1	0	1	0	2	1	0	4	0	8
BD86	F4	1282/01/1	HOLLOW FILL	2	6	1	1	4	0	1	3	1	17
BD88	I4	2307/00/1	FLOOR LAYER	<1	2	0	0	0	1	2	0	0	5
BD88	I4	2313/00/1	FLOOR LAYER	<1	0	0	0	1	0	0	1	0	2
BD88	I4	2315/00/1	FLOOR LAYER	7	31	1	0	54	0	5	86	1	178
BD88	I4	2375/01/1	GULLY FILL	3	29	0	0	24	0	2	16	0	71
BD88	W2	2112/00/3	LAYER	1	7	0	0	8	0	3	15	0	33
BD86	E5	1136/00/1	FLOOR LAYER	<1	0	0	0	1	0	0	0	0	1
BD86	E5	1149/01/1	PIT FILL	14	159	20	0	140	0	3	17	0	339
BD86	E5	1162/00/1	RUBBLE SURFACE	4	38	4	0	33	0	17	5	0	97
BD86	E5	1270/00/1	BURNT LAYER	5	43	7	1	60	0	10	4	0	125

 BURTON DASSETT, COMPOSITION OF BOTANICAL SAMPLES

SITE	PHASE	CONTEXT	CONTEXT TYPE	IPL	WHEAT	BARLEY	OATS	CEREAL	CHAFF	LEGUMES	WEEDS	OTHER	TOTAL
BD86	E5	1351/00/1	LAYER	<1	3	1	0	2	0	0	4	0	10
BD86	E5	1378/00/1	LAYER	18	37	65	52	173	0	2	115	0	444
BD86	E5	1378/00/2	LAYER	45	27	37	31	115	2	2	63	4	281
BD86	E5	1653/01/1	STONE LINED PIT FILL	<1	0	0	0	0	0	0	1	0	1
BD86	E5	1653/03/1	STONE LINED PIT FILL	2	23	0	0	7	0	0	2	0	32
BD86	E5	1655/01/1	GULLY FILL	1	5	0	0	3	2	2	5	0	17
BD86	E5	1659/03/1	HEARTH LAYER	8	14	3	2	6	0	1	50	0	76
BD86	A5	0042/00/2	FLOOR SURFACE?	4	39	5	1	41	0	1	14	0	101
BD86	A5	0098/00/2	FLOOR SURFACE	<1	1	0	0	1	2	0	0	0	4
BD86	A5	0110/01/1	PIT FILL	<1	2	0	0	0	0	0	1	0	3
BD86	A5	0111/00/1	LAYER	<1	2	0	0	4	0	4	0	0	10
BD86	A5	0136/03/1	PIT FILL	<1	6	0	0	1	0	2	2	0	11
BD86	A5	0152/00/1	LAYER	5	59	0	0	40	0	8	18	0	125
BD86	A5	0209/00/1	LAYER	<1	4	0	0	3	0	0	0	0	7
BD86	A5	0287/01/1	HOLLOW FILL	4	53	2	0	8	0	0	2	0	65
BD86	D15	0430/02/1	LAYER	<1	1	0	0	4	0	0	6	0	11
BD86	D15	0431/01/1	GULLY FILL	1	16	1	0	6	2	1	3	0	29
BD86	D15	0437/02/1	DITCH FILL	<1	8	0	0	8	1	0	3	0	20
BD86	D15	0454/04/1	DITCH FILL	<1	1	1	0	1	0	0	0	0	3
BD86	D15	0455/03/1	DITCH FILL	22	6	0	0	10	212	0	10	0	238
BD86	D15	0503/01/1	GULLY FILL	3	44	4	0	30	2	1	5	0	86
BD86	D15	0510/01/1	PIT FILL	2	19	0	0	13	2	2	9	1	46
BD86	D15	0512/01/1	DITCH FILL	5	78	10	0	32	1	3	4	0	128
BD86	D15	0836/04/1	DITCH FILL	2	18	1	1	23	0	1	6	0	50
BD86	D15	0930/05/1	DITCH FILL	18	125	9	0	272	17	6	14	1	444
BD86	D25	0577/00/2	FLOOR LAYER?	<1	5	1	0	7	1	4	4	0	22
BD86	D25	0666/00/1	LAYER	2	22	10	0	20	1	3	4	0	60
BD86	D25	1134/01/1	FLOOR LAYER	<1	0	0	0	1	0	1	1	0	3
BD86	D25	1194/01/1	HOLLOW FILL	1	5	4	0	9	0	1	4	1	24
BD86	D25	1202/00/1	FLOOR LAYER	<1	0	0	0	2	0	0	3	0	5
BD86	D25	1233/00/1	LAYER	4	33	5	0	28	1	2	32	3	104
BD86	D25	1242/02/1	GULLY FILL	2	31	2	1	13	0	2	3	0	52
BD86	D25	1468/01/1	GULLY FILL	4	28	16	0	39	2	8	13	0	106
BD86	F5	0913/00/1	FLOOR LAYER	<1	0	0	0	1	0	1	0	0	2
BD86	A6	0027/00/1	DEMOLITION RUBBLE	8	112	6	1	29	1	17	18	14	198
BD86	A6	0066/00/1	LAYER	5	40	3	0	26	0	18	8	0	95
BD86	A6	0066/00/2	LAYER	5	49	5	0	45	0	7	12	0	118
BD86	D26	0556/01/1	STONE DRAIN FILL	2	15	2	0	13	0	2	3	0	35
BD86	D26	0925/00/1	LAYER	8	94	8	0	79	0	11	16	1	209
BD86	D26	0992/01/1	ASHEY LAYER	<1	10	1	1	4	0	0	3	0	19
BD86	D26	1130/00/1	FLOOR LAYER	<1	6	1	0	9	0	1	3	0	20
BD86	D26	1172/01/1	GULLY FILL	4	41	0	0	33	0	10	11	1	96
BD86	D26	1199/00/1	BURNT PATCH	11	56	14	0	77	0	1	16	0	164
BD86	D26	1203/00/1	FLOOR LAYER	1	10	0	1	8	0	0	18	0	37
BD86	D26	1214/00/1	LAYER	19	165	36	2	146	2	55	57	2	465
BD86	E6	0909/00/1	LAYER	<1	2	0	0	4	0	0	3	0	9
BD86	E6	0977/01/1	BURNT PATCH MATRIX	<1	0	0	0	2	0	0	14	2	18
BD86	E6	1143/00/1	ASHY LAYER	14	129	12	1	134	0	17	44	2	339
BD86	E6	1192/01/1	HOLLOW FILL	2	14	1	0	25	0	8	14	0	62
BD86	E6	1679/01/1	HEARTH MATRIX	4	49	1	0	28	1	4	15	0	98
BD86	E7	0874/00/2	LAYER	9	117	10	0	60	0	13	15	0	215
BD86	E7	1180/00/1	LAYER	4	13	8	0	14	1	15	4	0	55
BD86	B2	0177/01/1	PIT FILL	<1	0	0	0	1	0	0	1	0	2
BD86	B2	0378/01/1	GULLY/PIT FILL	<1	0	0	0	0	6	0	0	0	6
BD86	B2	0425/01/1	PIT/HOLLOW FILL	<1	0	0	0	1	8	0	2	1	12
BD88	H7	2222/00/1	LAYER	5	47	1	0	57	0	2	20	1	128
	Totals:				4440	463	130	4083	382	511	2761	67	12837

COMPLETE LIST OF PLANT SPECIES

TAXON	COMMON NAME	NO. OF ITEMS ON SITE	NO. OF SAMPLES OCCURRING
Cultivated plants			
Triticum dicoccum/spelta	emmer/spelt	201	27
Triticum durum/turgidum	macaroni/rivet wheat	2	2
Triticum cf. *durum/turgidum*	macaroni/rivet wheat	2	2
Triticum spelta L.	spelt	135	34
Triticum cf. *spelta* L.	spelt	6	5
Triticum spelta/aestivum	spelt/bread wheat	4	3
Triticum cf. *spelta/aestivum*	spelt/bread wheat	4	1
Triticum aestivum s.l. (not incl. spelt)	bread/club wheat	5	5
Triticum cf. *aestivum* s.l.	bread/club wheat	4	2
Triticum sp. free-threshing	free-threshing wheat	1177	92
Triticum sp. cf. free-threshing	free-threshing wheat	1	1
Triticum sp.	wheat	3322	143
cf. *Triticum* sp.	wheat	1	1
Triticum/Secale	wheat/rye	10	7
cf. *Secale cereale* L.	rye	1	1
Hordeum vulgare L., hulled	hulled barley	27	15
Hordeum vulgare L., hulled germinated	-		
Hordeum vulgare L.	barley	448	87
Hordeum vulgare L., germinated	-		
cf. *Hordeum vulgare* L.	barley	5	1
Avena sp.	wild/cultivated oat	59	22
Avena sp. germinated	-		
Avena/Large Gramineae	oat/large-seeded grass	70	12
Avena/Large Gramineae, germinated	-		
Cereal indet.	unidentifiable cereal	3987	146
Cereal indet. coleoptiles	-		
Cereal/Large Gramineae	cereal/large grass	5	5
Vicia sativa ssp. *sativa* (L.) Boiss.	cultivated vetch	1	1
cf. *Vicia sativa* ssp. *sativa* (L.) Boiss.	cultivated vetch	7	6
Vicia sativa/faba	cultivated vetch/bean	1	1
Vicia faba var. *minuta* (Alef.) Mansf.	Celtic bean	6	3
cf. *Vicia faba* var. *minuta* (Alef.) Mansf.	Celtic bean	1	1
Vicia faba L.	field bean	14	12
cf. *Vicia faba* L.	field bean	9	8
Pisum sativum L.	pea	11	10
cf. *Pisum sativum* L.	pea	10	9
Vicia/Pisum	bean/pea	84	27
Vicia/Lathyrus/Pisum	bean/vetch/vetchling/pea	402	70
Wild plants			
Ranunculus acris/repens/bulbosus	buttercups	3	3
Ranunculus arvensis L.	corn crowfoot	5	5
cf. *Ranunuculus arvensis* L.	corn crowfoot	1	1
Ranunculus parviflorus L.	small-flowered buttercup	1	1
Ranunculus flammula/reptans	lesser spearwort/creeping spearwort		11
cf. *Ranunculus* sp.	-	1	1
Brassica rapa L.	turnip	27	3
Brassica cf. *rapa* L.	turnip	20	10
Brassica rapa/nigra	turnip/black mustard	115	23
Brassica sp.	wild cabbage/turnip/mustard	1	1
Brassica/Sinapis	-	1	1
Raphanus raphanistrum L.	wild radish	2	2
Cruciferae indet.	-	25	3

Agrostemma githago L.	corn cockle	7	7
Caryophyllaceae indet.	-	3	3
Chenopodium sp.	goosefoot etc.	4	4
Atriplex sp.	orache	2	2
Chenopodiaceae indet.	-	14	9
cf. Chenopodiaceae indet.	-	3	3
Genista/Ulex type	greenweed/gorse	1	1
Vicia hirsuta (L.) S.F. Gray	hairy tare	2	2
Vicia hirsuta (L.) S.F. Gray (immature)	hairy tare	1	1
Vicia tetrasperma (L.) Shreber	smooth tare	15	9
Vicia cf. *tetrasperma* (L.) Shreber	smooth tare	6	3
cf. *Vicia tenuissima* (Beib.) Schknz. & Thell.	slender tare	1	1
cf. *Lathyrus aphaca* L.	yellow vetchling	1	1
Lathyrus pratensis L.	meadow vetchling	1	1
Vicia/Lathyrus	vetch/vetchling	1317	101
Medicago lupulina L.	black medick	2	1
Trifolium type	clover type	14	8
Melilotus/Medicago/Large Trifolium	melilot/medick/clover	494	90
Leguminosae indet.	-	4	3
cf. Leguminosae	-	1	1
Prunus sp.	sloe/bullace/damson/cherry	2	2
cf. *Prunus* sp.	-	2	1
?Rosaceae	-		
Scandix pecten-veneris L.	shepherd's needle	4	3
cf. *Scandix pecten-veneris* L.	shepherd's needle	5	5
Conium maculatum L.	hemlock	4	1
Bupleurum rotundifolium L.	hare's ear	1	1
Umbelliferae indet.	-	14	9
cf. Umbelliferae indet.	-	1	1
Polygonum aviculare agg.	knotgrass	18	13
Polygonum cf. *aviculare* agg.	knotgrass	2	1
Polygonum sp.	-	1	1
Fallopia convolvulus (L.) A. Löve	black bindweed	5	5
Rumex acetosella agg.	sheep's sorrel	4	2
Rumex sp.	dock	292	80
cf. *Rumex* sp.	dock	5	3
Polygonaceae indet.	-	2	2
cf. Polygonaceae indet.	-	9	2
Polygonaceae/Cyperaceae	-	17	7
Corylus avellana L.	hazel	7	6
cf. *Corylus avellana* L.	hazel	1	1
cf. *Calluna vulgaris* L. (immature flower)	heather	1	1
Hyoscyamus niger L.	henbane	32	6
Solanum nigrum L.	black nightshade	1	1
Veronica hederifolia L.	ivy-leaved speedwell	2	2
cf. *Veronica hederifolia* L.	ivy-leaved speedwell	1	1
Rhinanthus sp.	yellow rattle	7	1
Sherardia arvensis L.	field madder	3	3
Galium palustre agg.	marsh bedstraw	1	1
Galium aparine L.	cleavers	7	7
Galium sp.	bedstraw	7	5
Anthemis cotula L.	stinking mayweed	2	2
Centaurea cyanus L.	cornflower	1	1
cf. *Centaurea* sp.	knapweed/thistle	4	2
Picris echioides L.	bristly ox-tongue	2	1
Compositae indet.	-	2	2
cf. Compositae indet.	-	2	2
Sparganium sp.	bur-reed	2	2
Eleocharis palustris/uniglumis	spike-rush	6	5
Carex sp.	sedge	38	26

cf. *Carex* sp.	sedge	1	1
Lolium temulentum L.	darnel	4	1
cf. *Lolium temulentum* L.	darnel	4	4
Arrhenatherum elatius (L.) Beauv. ex J. & C. Presl.	false oat-grass	1	1
Gramineae indet.	grass	181	73
cf. Gramineae	grass	4	4
cf. *Claviceps purpurea*	ergot	1	1
Tree/shrub buds	-	4	4

Key: r = rachises, spfk = spikelet forks, gb = glume bases, cmnd = culm nodes, cmbs = culm bases, g = germinated, rh/rt = rhizome/root, frg = fragment
All other items are 'seeds' in the broad sense unless noted otherwise. Identifications by Lisa Moffett.

Context:	0079/01/1	0093/01/1	0097/01/1	0113/01/1	0164/01/1	0169/01/1	0252/01/1	0300/01/1	0191/01/1	0195/01/1	0200/01/1	0373/01/1
Sample volume (litres):	28	22	18	22	15	20	15	25	25	22	18	27
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0
Phase:	A1	A1	A1	A1	A1	A1	A1	A1	B1	B1	B1	B1
Period:	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med
Triticum dicoccum/spelta (spfk)	-	-	-	-	-	-	-	1	-	-	-	-
Triticum dicoccum/spelta (gb)	-	1	-	1	1	-	-	2	-	-	-	3
Triticum cf. spelta (r)	-	-	-	-	-	-	-	-	-	-	-	1
Triticum spelta (gb)	-	1	-	2	-	1	-	-	-	-	-	3
Triticum cf. spelta (gb)	-	-	1	-	-	-	-	-	1	-	-	-
Triticum sp. free-threshing	27	-	-	-	-	-	3	-	-	-	-	-
Triticum sp.	63	-	-	-	-	1	-	-	-	-	-	-
Hordeum vulgare	2	-	-	-	-	-	-	-	-	-	-	-
Cereal indet.	40	1	-	-	1	2	3	-	-	1	-	-
Vicia/Pisum	2	-	-	-	-	-	-	-	-	-	-	-
Vicia hirsuta	1	-	-	-	-	-	-	-	1	-	-	-
Vicia tetrasperma	1	-	-	-	-	-	-	-	-	-	-	-
Vicia/Lathyrus	1	-	-	-	-	-	-	-	4	-	-	-
Medicago/Melilotus/Large Trifolium	1	-	-	-	-	-	-	-	-	-	-	-
Polygonum aviculare agg.	1	-	-	-	-	-	-	-	-	-	-	-
Gramineae indet. (cmbs)	-	-	-	-	-	-	-	-	-	-	1	-
Gramineae indet.	-	-	-	-	-	-	1	-	-	-	-	-
Unidentified (rh/rt)	-	-	-	-	-	-	-	1	-	-	-	-

Context:	0377/01/1	0398/01/1	0419/02/1	0679/01/1	0714/01/1	0734/01/1	0739/01/1	0773/01/1	1799/01/1	1767/01/1	1955/01/1	1983/01/1	2432/00/1
Sample volume (litres):	25	25	25	25	25	25	25	25	25	25	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3
Phase:	B1	B1	B1	B1	B1	B1	B1	B1	D2i	Ei	G1	G1	Hi
Period:	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	pre-Med	E/M 13c
Triticum dicoccum/spelta (gb)	2	2	4	3	2	1	3	2	-	-	-	-	-
Triticum durum/turgidum (r)	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum spelta (r)	-	-	-	1	-	-	-	-	-	-	-	-	-
Triticum spelta (gb)	4	2	1	6	2	4	2	3	-	-	1	-	-
Triticum aestivum s.l. (r)	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum sp. free-threshing	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum sp.	-	-	-	-	-	-	-	1	-	-	-	-	16
Cereal indet.	1	1	-	-	-	-	-	-	1	1	-	1	10
Vicia/Pisum/Lathyrus	-	-	-	-	-	-	-	-	-	-	-	-	3
Brassica rapa/nigra	-	-	-	-	-	-	-	-	-	-	-	-	1
cf. Chenopodiaceae indet.	-	-	-	-	-	-	1	-	-	-	-	-	-
Vicia/Lathyrus	-	-	1	-	2	-	-	-	-	-	1	-	18
Medicago/Melilotus/Large Trifolium	-	1	-	-	-	-	-	-	-	-	-	-	6
Umbelliferae indet.	-	-	-	-	-	-	-	-	-	-	-	-	2
Polygonum aviculare agg.	-	-	-	-	-	-	-	-	-	-	-	-	1
Fallopia convolvulus	-	-	-	-	-	-	-	-	-	-	-	-	1
Rumex acetosella agg.	-	1	-	-	-	-	-	-	-	-	-	-	-
Rumex sp.	1	-	-	-	-	-	-	-	-	-	-	-	-
cf. Polygonaceae indet.	-	-	-	-	-	-	-	-	-	-	-	-	2
Galium aparine	-	-	-	-	1	-	-	-	-	-	-	-	-
Carex sp.	-	-	-	-	-	-	-	-	-	-	-	-	1
Gramineae indet. (cmbs)	-	1	-	-	-	-	2	1	-	-	-	-	-
Gramineae indet.	-	-	-	-	-	-	-	-	-	-	-	-	1
Unidentified	-	-	-	-	-	-	-	1	-	-	-	-	-

Context:	2428/00/1	2463/01/1	2472/01/1	2318/01/1	2443/01/1	2309/00/1	2370/01/1	2389/01/1	2154/01/1	2438/00/1	0059/01/1	0060/01/1	0064/01/1
Sample volume (litres):	25	25	25	25	25	25	25	25	25	25	10	22	18
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	7	6	5	9	26	10	11	3	1	1	<1	4	0
Phase:	K1	K1	K1	H2	H2	I2	I2	I2	J2	K2	A2	A2	A2
Period:	E/M 13C	E/M 13C	E/M 13C	M/L 13C	M/L 13C	M/L 13C	M/L 13C	M/L 13C	M/L 13C	M/L 13C	L 13C	L 13C	L 13C
Triticum spelta (r)	1	-	-	-	-	-	-	-	-	-	-	-	-
Triticum spelta type (r)	-	-	-	-	-	1	-	-	-	-	-	-	-
Triticum aestivum s.l. (r)	-	-	-	-	-	1	-	-	-	-	-	-	-
Triticum sp. free-threshing	14	3	5	16	16	13	6	5	3	-	-	8	-
Triticum sp. (r)	1	-	-	-	-	-	-	-	-	-	-	-	-
Triticum sp.	26	54	22	76	53	66	48	15	4	5	-	47	3
Hordeum vulgare	1	-	-	3	5	1	4	-	-	1	-	1	-
Avena sp.	3	-	2	-	2	-	1	-	1	-	-	-	-
Cereal indet.	54	45	25	76	81	85	29	27	4	16	-	23	2
Cereal/Large Gramineae (cmnd)	-	-	1	-	-	-	-	-	-	-	-	-	-
cf. Vicia faba	1	-	-	-	-	-	-	-	-	-	-	-	-
cf. Pisum sativum	-	-	-	-	-	-	-	-	-	-	-	1	-
Vicia/Pisum	-	-	-	1	-	-	3	-	-	3	-	-	-
Vicia/Pisum/Lathyrus	-	5	7	-	4	5	-	2	3	-	-	3	-
Brassica cf. rapa	-	-	-	-	4	-	-	-	-	-	-	-	-
Brassica rapa/nigra	3	-	3	1	-	5	4	1	-	-	-	-	-
Agrostemma githago	-	-	-	-	1	-	-	-	-	-	-	-	-
Agrostemma githago (ctip)	-	-	-	1	-	-	1	-	-	-	-	-	-
Chenopodium sp.	-	-	-	-	1	-	-	-	-	-	-	-	-
Chenopodiaceae indet.	1	-	1	-	-	-	-	-	1	-	-	1	-
Vicia hirsuta (immature)	-	-	-	-	1	-	-	-	-	-	-	-	-
Vicia tetrasperma	-	-	-	-	7	-	-	-	-	-	-	-	-
Vicia cf. tetrasperma	-	-	-	4	-	-	1	1	-	-	-	-	-
Vicia/Lathyrus	51	26	29	41	402	29	146	10	2	6	-	2	-
Medicago/Melilotus/Large Trifolium	4	4	10	4	22	28	16	4	5	3	-	2	-
cf. Prunus sp. (frg)	-	-	-	-	-	-	-	-	1	1	-	-	-
Scandix pecten-veneris	1	-	-	-	-	-	-	-	-	-	-	-	-
cf. Scandix pecten-veneris	-	-	-	-	1	1	-	-	-	-	-	-	-
Bupleurum rotundifolium	-	-	-	-	-	-	1	-	-	-	-	-	-
Umbelliferae indet.	-	-	-	-	2	2	2	-	-	-	-	-	-
cf. Umbelliferae indet.	-	-	1	-	-	-	-	-	-	-	-	-	-
Polygonum aviculare agg.	2	-	-	-	2	1	1	1	-	-	-	-	-
Rumex sp.	4	1	3	3	24	6	8	3	5	1	-	2	-
Polygonaceae indet.	1	-	-	-	-	-	-	-	-	-	-	-	-
Corylus avellana (frg)	1	2	-	-	-	-	-	-	-	-	-	-	-
cf. Corylus avellana (frg)	-	-	-	-	-	-	-	1	-	-	-	-	-
Galium aparine	-	-	-	-	1	-	-	-	-	-	-	-	-
Galium sp.	1	-	-	-	-	-	-	-	-	-	-	-	-
Anthemis cotula	-	-	-	-	-	1	-	-	-	-	-	-	-
Centaurea cyanus	-	-	-	-	-	-	1	-	-	-	-	-	-
cf. Centaurea sp.	-	-	-	1	-	-	3	-	-	-	-	-	-
Compositae indet.	-	-	-	-	-	-	-	-	-	-	-	1	-
Sparganium sp.	-	-	-	-	1	-	-	-	-	-	-	-	-
Carex sp.	1	-	4	-	2	-	-	-	-	-	-	-	-
Arrhenatherum elatius (tbr)	-	-	-	-	-	-	-	-	-	-	1	-	-
Gramineae indet. (cmnd)	1	-	-	-	-	-	1	-	-	-	-	-	-
Gramineae indet.	4	3	4	3	13	3	8	2	-	-	-	-	1
Unidentified	1	1	-	-	-	-	-	2	3	-	-	-	-

Context:	0106/01/1	0168/01/1	0242/01/1	0478/01/1	1427/01/1	1298/00/1	1404/00/1	1661/00/1	1888/00/1	1301/00/1	1326/00/1	2384/00/1	2387/01/1
Sample volume (litres):	18	23	25	25	25	25	25	20	25	25	25	25	5
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	2	3	2	<1	<1	<1	<1	1	1	1	1	6	1
Phase:	A2	A2	A2	D12	F2	E3	E3	E3	E3	F3	F3	H3	K3
Period:	L 13C	L 13C	L 13C	L 13 C	L 13 C	E 14C	E 14C	E 14C	E 14C	E 14C	E 14C	E 14C	E 14C
Triticum dicoccum/spelta (gb)	-	-	5	-	-	-	-	-	-	-	-	-	-
Triticum cf. durum/turgidum (r)	-	-	-	-	-	-	-	-	-	-	-	1	-
Triticum spelta (gb)	-	-	4	-	-	-	-	-	1	-	-	-	-
Triticum sp. free-threshing (r)	-	-	-	-	-	-	-	-	-	1	-	-	-
Triticum sp. free-threshing	10	17	1	-	-	-	-	3	-	-	-	-	-
Triticum sp. (r)	-	-	-	-	-	-	-	-	-	-	1	-	-
Triticum sp. (spfk)	-	-	-	-	-	-	-	-	-	1	-	-	-
Triticum sp.	13	23	12	1	-	-	1	2	2	3	4	25	-
Hordeum vulgare hulled (ggr)	-	-	-	-	-	-	-	-	2	-	-	-	-
Hordeum vulgare	1	4	1	-	-	-	-	3	3	1	-	1	-
Avena sp.	-	-	-	-	-	-	-	-	2	-	-	-	-
Avena/Large Gramineae	-	-	-	-	-	-	-	-	2	-	-	-	-
Cereal indet.	7	24	8	2	1	-	1	-	8	4	5	38	2
Cereal/Large Gramineae (cmnd)	-	-	-	-	-	-	-	-	-	-	-	1	-
cf. Vicia sativa ssp. sativa	1	-	-	-	-	-	-	-	-	-	1	-	-
Pisum sativum	-	-	-	-	-	-	-	1	-	-	-	-	-
Vicia/Pisum	5	-	-	-	-	1	-	-	1	-	-	-	-
Vicia/Pisum/Lathyrus	-	1	-	-	-	-	-	8	-	1	-	1	-
Brassica rapa/nigra	-	-	-	-	-	-	-	-	-	-	2	1	-
Chenopodiaceae indet.	-	-	-	-	-	-	-	-	-	-	-	2	-
Vicia tetrasperma	-	-	-	-	-	-	-	-	-	-	1	-	-
Vicia/Lathyrus	-	1	-	-	-	1	-	1	2	-	3	57	-
Trifolium type	1	-	-	-	-	-	-	-	-	-	-	-	-
Medicago/Melilotus/Large Trifolium	-	-	3	-	-	-	-	-	-	-	-	13	-
Leguminosae indet.	-	-	-	-	-	-	-	-	-	-	-	-	1
Polygonum aviculare agg.	1	-	-	-	-	-	-	-	-	-	-	-	-
Fallopia convolvulus	-	-	-	-	-	-	-	-	-	-	-	-	1
Rumex sp.	2	-	-	-	-	1	-	-	-	1	1	3	1
Polygonaceae/Cyperaceae	-	-	2	-	-	-	-	-	-	-	-	-	-
Corylus avellana (frg)	-	-	-	-	-	-	-	-	1	-	-	1	-
Carex sp.	1	-	-	-	-	-	-	-	-	-	-	2	-
Gramineae indet. (cmnd)	-	-	-	-	-	-	-	-	-	-	-	1	-
Gramineae indet.	-	1	-	-	1	-	-	-	2	-	-	1	-
cf. Gramineae (rh)	-	-	1	-	1	-	-	-	-	1	-	-	-
Unidentified (fibs)	1	1	1	-	-	-	-	-	-	-	-	-	-

Context:	2488/00/1	0447/01/1	0629/01/1	0631/01/1	0998/01/1	0999/01/1	1123/01/1	1191/01/1	1241/00/1	2133/00/1	2137/00/1	2377/00/1	2317/00/1
Sample volume (litres):	7	25	25	25	23	25	9	15	25	25	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	12	4	1	1	<1	<1	23	1	1	1	5	2	9
Phase:	K3	D13	D13	D13	E4	E4	E4	E4	E4	H4	H4	H4	K4
Period:	E 14C	E/M 14C	E/M 14C	E/M 14C	M 14C	M 14C	M 14C	M 14C	M 14C	M-L 14C	M-L 14C	M-L 14C	M-L 14C
Triticum dicoccum/spelta (gb)	-	1	-	1	-	-	-	-	-	-	-	-	-
Triticum sp. free-threshing (r)	-	-	-	-	-	-	1	-	-	-	-	-	-
Triticum sp. free-threshing	8	12	-	3	-	-	12	-	-	-	10	6	24
Triticum sp. (r)	-	-	-	-	-	-	-	-	-	-	-	1	-
Triticum sp.	17	43	3	3	3	1	45	3	6	12	42	17	70
Triticum/Secale	-	-	-	1	-	-	-	-	-	-	-	-	-
Hordeum vulgare hulled	-	-	-	-	-	-	-	-	-	-	-	-	1
Hordeum vulgare	-	5	-	-	-	-	1	-	-	1	6	-	5
Avena sp.	-	-	-	-	-	-	-	-	-	-	-	-	1
Avena/Large Gramineae	2	-	-	-	-	-	-	-	-	-	-	-	-
Cereal indet.	23	34	8	2	2	2	119	6	10	10	38	15	65
Vicia faba	-	-	-	-	-	1	-	-	-	-	-	-	-
Vicia/Pisum	-	1	-	-	-	-	-	-	-	-	4	-	16
Vicia/Pisum/Lathyrus	8	-	-	-	-	1	14	1	-	1	3	2	-
Ranunculus parviflorus	-	-	-	-	-	-	-	-	-	-	1	-	-
Brassica cf. rapa	-	-	-	-	-	-	-	-	-	-	-	-	1
Brassica rapa/nigra	-	-	-	-	1	-	-	-	1	-	1	-	-
Chenopodium sp.	-	-	-	-	-	-	-	-	-	-	-	-	1
Vicia tetrasperma	-	-	-	-	-	-	-	-	-	-	1	1	-
Vicia/Lathyrus	5	1	1	-	-	-	1	1	-	1	9	7	16
Trifolium type	-	-	3	3	-	-	-	-	-	-	-	-	-
Medicago/Melilotus/Large Trifolium	9	2	-	-	1	1	1	1	-	1	8	5	11
Prunus sp. (frg)	-	-	-	-	-	-	-	-	-	-	1	-	-
Scandix pecten-veneris	-	-	-	-	-	-	-	-	-	-	1	-	-
Umbelliferae indet.	2	-	-	-	-	-	-	-	-	-	1	-	-
Rumex sp.	5	1	1	-	-	1	6	1	-	-	3	2	8
Polygonaceae/Cyperaceae	-	-	-	-	-	-	-	-	-	1	-	-	-
Veronica hederifolia	-	-	-	-	-	-	-	-	-	-	-	-	1
cf. Veronica hederifolia	-	-	-	-	-	-	-	-	-	-	1	-	-
Sherardia arvensis	-	-	-	-	1	-	-	-	-	-	-	-	-
Carex sp.	-	-	-	-	-	-	1	1	-	-	-	1	-
Gramineae indet.	7	-	-	-	-	-	-	-	1	-	1	1	1
Tree/shrub (bud)	-	-	-	-	-	-	1	-	-	-	-	-	-
Unidentified (?)	1	-	-	-	-	-	3	-	-	-	1	-	-

Context:	2317/00/2	2357/00/1	2368/00/1	2445/00/1	0047/01/1	0084/01/1	0221/01/1	0248/01/1	1560/01/1	2107/0/13	2211/0/19	0140/01/1	0255/02/1
Sample volume (litres):	25	25	25	25	44	24	25	23	25	25	25	23	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	13	1	5	9	1	<1	4	<1	38	6	1	<1	<1
Phase:	K4	K4	K4	K4	A3	A3	A3	A3	D23	J3	J3	A4	A4
Period:	M/L 14C	M/L 14C	M/L 14C	M/L 14C	14C	14C	14C	14C	14C	14C	14C	E 15C	E 15C
Triticum dicoccum/spelta (gb)	-	-	-	-	4	-	-	-	-	-	-	-	-
Triticum spelta (r)	-	-	-	-	1	-	-	-	-	-	-	-	-
Triticum spelta (gb)	-	-	-	-	10	4	3	-	-	-	-	-	-
Triticum cf. aestivum s.l.	-	-	-	-	-	-	-	2	-	-	-	-	-
Triticum sp. free-threshing	20	-	5	40	7	-	6	1	186	12	-	1	1
Triticum sp.	100	10	19	72	14	2	29	-	395	35	7	1	4
Triticum/Secale	-	-	-	-	1	-	2	-	-	-	-	-	-
Hordeum vulgare	5	1	4	1	2	1	4	-	-	4	-	1	-
Avena sp.	1	-	-	-	-	-	-	-	-	-	-	-	-
Cereal indet.	107	8	34	73	8	2	57	5	346	69	5	2	-
Cereal indet. (col)	-	-	-	-	1	-	-	-	-	-	-	-	-
Vicia faba	-	-	1	1	-	-	-	-	-	-	-	-	-
cf. Vicia faba	1	-	-	-	-	-	-	-	-	-	-	-	-
Vicia/Pisum	3	-	14	-	2	-	-	-	-	-	-	-	-
Vicia/Pisum/Lathyrus	-	1	-	-	-	-	1	-	3	11	-	-	-
Brassica rapa/nigra	3	-	-	-	-	-	-	-	-	-	-	-	-
Brassica cf. rapa	-	-	-	2	-	-	-	-	2	1	-	-	-
Brassica rapa/nigra	-	-	-	1	-	-	-	-	3	-	-	-	-
Brassica/Sinapis	-	-	-	-	-	-	-	-	-	-	1	-	-
Atriplex sp.	-	-	-	-	-	-	-	-	1	-	-	-	-
Vicia/Lathyrus	55	15	9	13	2	2	-	-	5	3	4	-	-
Trifolium type	-	-	-	-	-	-	-	1	-	-	-	1	-
Medicago/Melilotus/Large Trifolium	23	1	32	15	2	-	-	-	9	2	4	-	-
Leguminosae indet.	-	-	-	-	-	-	1	-	-	-	-	-	-
Umbelliferae indet.	1	-	1	-	-	-	-	-	-	-	-	-	-
Polygonum sp.	-	-	1	-	-	-	-	-	-	-	-	-	-
Rumex sp.	8	1	3	3	-	-	-	-	3	5	1	1	-
cf. Rumex sp.	-	-	-	-	-	-	2	-	-	-	-	-	-
Corylus avellana (frg)	-	-	-	1	-	-	-	-	-	-	-	-	-
cf. Compositae indet.	-	-	-	-	-	-	-	-	-	-	1	-	-
Eleocharis palustris/uniglumis	1	-	-	-	-	-	-	1	-	-	-	-	-
Carex sp.	-	-	-	1	-	-	1	-	-	-	-	-	-
Gramineae indet.	4	-	2	1	1	-	-	-	1	2	-	-	-
Unidentified (?)	1	-	-	-	-	-	1	-	-	-	-	-	-

Context:	0285/01/1	2378/01/1	2082/01/1	2204/0/31	2205/00/5	2050/03/1	2165/02/3	2165/05/3	2168/00/7	0514/01/1	0574/01/2	0598/01/1	0615/01/1
Sample volume (litres):	25	25	10	25	25	25	25	25	25	20	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	1	2	15	<1	<1	<1	1	1	<1	3	5	<1	2
Phase:	A4	H6	J4	J4	J4	J5	J5	J5	J5	D14	D14	D14	D14
Period:	E 15C	E 15C	E 15C	E 15C	E 15C	E 15C	E 15C	E 15C	E 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C
Triticum dicoccum/spelta (gb)	-	-	-	-	-	-	3	-	-	-	-	-	-
Triticum spelta (r)	-	-	-	-	-	-	-	-	-	1	-	-	-
Triticum spelta (gb)	-	-	-	-	-	-	-	-	-	1	-	-	-
Triticum sp. free-threshing	2	1	11	-	2	-	-	-	-	-	5	7	10
Triticum sp. (spfk)	-	1	-	-	-	-	-	-	-	-	-	-	-
Triticum sp.	9	16	27	2	8	3	4	10	1	9	53	-	11
Hordeum vulgare (lax) (r)	-	-	2	-	-	-	-	1	-	-	-	-	-
Hordeum vulgare hulled	-	-	1	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare	1	2	8	-	-	-	-	1	-	7	1	3	2
Avena sp.	1	-	4	-	-	-	-	-	-	-	-	-	-
Avena/Large Gramineae	-	-	4	-	-	-	-	-	-	-	-	-	-
Cereal indet.	6	10	37	2	2	2	4	6	1	11	47	-	12
cf. Vicia faba	-	-	1	-	-	-	-	-	-	-	-	-	-
Pisum sativum (hilum)	-	1	-	-	-	-	-	-	-	-	-	-	-
cf. Pisum sativum	-	-	2	-	-	-	-	-	-	-	-	-	-
Vicia/Pisum	1	-	-	-	-	-	-	1	1	-	-	-	-
Vicia/Pisum/Lathyrus	-	4	26	1	-	-	-	-	-	-	-	-	2
Chenopodiaceae indet.	-	-	3	-	-	-	-	-	-	-	-	-	-
cf. Lathyrus aphaca	-	-	-	-	-	-	-	-	-	1	-	-	-
Vicia/Lathyrus	-	7	7	-	-	2	-	2	1	3	5	1	-
Medicago/Melilotus/Large Trifolium	-	2	6	-	-	1	1	2	1	16	2	-	2
Polygonum aviculare agg.	-	-	-	2	-	-	-	-	-	-	-	-	1
Rumex sp.	-	4	6	-	-	1	1	1	-	2	-	-	-
Hyoscyamus niger	1	-	-	-	-	-	-	-	-	-	-	-	1
Eleocharis palustris/uniglumis	-	-	-	-	-	-	-	1	-	-	-	-	-
Carex sp.	-	-	-	-	-	-	-	-	-	-	1	-	-
Gramineae indet.	2	2	5	-	-	1	-	-	-	-	1	-	-
Unidentified (?)	1	-	-	-	-	-	1	-	2	-	1	-	-

Context:	0657/01/1	1200/00/2	1201/01/1	1230/00/1	1275/01/1	1289/00/1	1315/01/1	1475/01/1	1479/01/1	1543/01/1	1548/04/1	1164/00/1	1239/00/1
Sample volume (litres):	1	25	12	25	25	25	16	25	25	25	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	12	2	2	6	6	3	2	3	3	2	<1	<1	<1
Phase:	D24	D24	D24	D24	D24	D24	D24	D24	D24	D24	D24	F4	F4
Period:	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C
Triticum cf. aestivum s.l.	2	-	-	-	-	-	-	-	-	-	-	-	-
Triticum sp. free-threshing	-	1	-	5	2	5	2	2	4	-	-	-	-
Triticum sp. (r)	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum sp.	4	12	4	75	19	18	6	8	15	7	6	3	-
Hordeum vulgare hulled	-	-	-	-	-	-	3	-	4	-	-	-	-
Hordeum vulgare	-	2	1	5	13	-	6	5	-	2	-	-	1
Avena sp.	-	-	-	1	2	2	-	-	-	1	-	-	-
Avena/Large Gramineae	-	-	-	-	-	2	-	-	-	-	-	-	-
Cereal indet.	3	25	6	35	57	16	11	21	27	12	3	1	2
Vicia sativa ssp. sativa	-	-	-	1	-	-	-	-	-	-	-	-	-
Vicia faba	-	1	-	-	-	-	-	1	-	-	-	-	-
cf. Vicia faba	-	-	-	-	-	-	-	1	-	-	-	-	-
Pisum sativum	-	-	-	2	-	-	-	-	-	-	-	-	-
cf. Pisum sativum	-	-	-	-	-	-	-	1	-	-	-	-	-
Vicia/Pisum	-	-	-	-	-	1	-	-	-	2	-	-	-
Vicia/Pisum/Lathyrus	-	-	-	8	-	3	1	1	15	-	-	-	-
Ranunculus arvensis	-	-	-	-	-	-	-	1	-	-	-	-	-
cf. Ranunculus arvensis	-	-	-	-	-	-	-	1	-	-	-	-	-
cf. Ranunculus sp.	-	-	-	-	-	-	-	-	-	1	-	-	-
Brassica rapa	-	-	-	-	-	-	-	-	4	-	-	-	-
Brassica cf. rapa	-	1	2	-	-	1	-	2	-	-	-	-	-
Brassica rapa/nigra	-	-	-	-	-	-	-	-	-	-	-	-	1
Cruciferae indet.	-	-	-	-	-	-	-	12	-	-	-	-	-
Chenopodiaceae indet.	-	-	2	-	-	-	-	-	-	-	-	-	-
cf. Chenopodiaceae indet.	-	-	-	-	-	-	-	1	-	-	-	-	-
Lathyrus pratensis	-	-	-	-	1	-	-	-	-	-	-	-	-
Vicia/Lathyrus	-	2	2	9	61	5	-	3	4	4	1	-	1
Trifolium type	2	-	-	-	-	-	-	-	-	-	-	-	-
Medicago/Melilotus/Large Trifolium	-	10	4	5	1	2	-	6	1	9	-	-	1
Polygonum aviculare agg.	-	1	-	-	-	-	-	-	-	-	-	-	-
Polygonum cf. aviculare agg.	-	-	1	-	-	-	-	-	-	-	-	-	-
Rumex acetosella agg.	-	-	-	3	-	-	-	-	-	-	-	-	-
Rumex sp.	-	6	-	-	-	9	-	3	4	1	1	-	-
cf. Rumex sp.	-	-	1	-	-	-	-	-	-	-	-	-	-
Hyoscyamus niger	-	-	-	-	-	-	-	1	-	-	-	-	-
Rhinanthus sp.	-	-	-	-	-	-	-	7	-	-	-	-	-
Picris echioides	-	-	2	-	-	-	-	-	-	-	-	-	-
cf. Compositae indet.	-	-	-	-	-	-	-	1	-	-	-	-	-
Carex sp.	1	-	-	-	-	-	-	-	-	1	-	-	-
cf. Gramineae (rhfr)	-	-	-	-	-	-	-	-	-	-	-	1	-
Gramineae indet.	-	-	-	3	5	1	-	-	-	2	-	-	1
cf. Claviceps purpurea (ergot)	-	-	-	-	-	1	-	-	-	-	-	-	-
Tree/shrub (bud)	-	-	-	1	-	-	-	-	-	-	-	-	-
Unidentified	-	1	1	4	-	-	-	3	-	-	-	-	1

Context:	1282/01/1	2307/00/1	2313/00/1	2315/00/1	2375/01/1	2112/00/3	1136/00/1	1149/01/1	1162/00/1	1270/00/1	1351/00/1	1378/00/1	1378/00/2
Sample volume (litres):	10	25	25	25	25	25	25	25	25	25	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	25
Items per litre:	2	<1	<1	7	6	1	<1	14	4	5	<1	18	11
Phase:	F4	I4	I4	I4	I4	M2	E5	E5	E5	E5	E5	E5	E5
Period:	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M 15C	E-M/L 15C	E-M/L 15C	E-M/L 15C	E-M/L 15C	E-M/L 15C	E-M/L 15C	E-M/L 15C
Triticum spelta/aestivum (r)	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum sp. free-threshing (r)	-	1	-	-	-	-	-	-	-	-	-	-	-
Triticum sp. free-threshing	-	-	-	1	11	-	-	67	11	24	-	12	7
Triticum sp. (r)	-	-	-	-	-	-	-	-	-	-	-	-	2
Triticum sp.	6	2	3	30	40	7	-	92	27	57	3	25	20
Hordeum vulgare hulled	-	-	-	-	-	-	-	-	-	-	-	3	-
Hordeum vulgare	1	-	-	1	2	-	-	20	9	10	1	39	16
Hordeum vulgare (ggr)	-	-	-	-	-	-	-	-	-	-	-	23	21
Avena sp.	-	-	-	-	-	-	-	-	-	1	-	9	6
Avena sp. (ggr)	-	-	-	-	-	-	-	-	-	-	-	2	11
Avena/Large Gramineae	1	-	-	-	-	-	-	-	-	-	-	41	8
Avena/Large Gramineae (ggr)	-	-	-	-	-	-	-	-	-	-	-	-	6
Cereal indet.	4	-	7	54	48	8	1	140	33	18	2	173	115
Cereal/Gramineae (col)	-	-	-	-	-	-	-	-	-	-	-	2	-
Cereal/Large Gramineae (cmnd)	-	-	-	-	-	-	-	-	-	-	-	-	1
cf. Vicia sativa ssp. sativa	-	-	-	1	1	-	-	-	-	-	-	-	-
Vicia faba var. minuta	1	-	-	-	-	-	-	-	-	-	-	-	-
Pisum sativum	-	-	-	-	1	-	-	-	1	-	-	-	-
Pisum sativum (hilum)	-	-	-	-	-	-	-	-	1	-	-	-	-
cf. Pisum sativum	-	-	-	-	-	-	-	-	-	-	-	1	-
Vicia/Pisum/Lathyrus	-	2	1	4	4	3	-	3	16	15	-	1	2
Ranunculus arvensis	-	-	-	-	-	-	-	-	-	-	-	-	1
Brassica rapa	-	-	-	-	-	-	-	-	-	-	-	-	21
Brassica rapa/nigra	1	-	-	3	1	-	-	-	-	-	1	66	11
Raphanus raphanistrum (pdfr)	-	-	-	-	-	-	-	-	-	-	-	-	1
Cruciferae indet.	-	-	-	-	-	-	-	-	-	-	-	12	-
Caryophyllaceae indet.	-	-	-	-	-	1	-	-	-	-	-	-	-
Chenopodium sp.	-	-	-	-	-	-	-	-	-	-	-	-	1
Vicia/Lathyrus	-	-	2	52	10	5	-	15	1	1	2	6	2
Medicago/Melilotus/Large Trifolium	2	-	1	9	25	5	-	-	2	2	-	7	4
Scandix pecten-veneris	-	-	-	-	-	-	-	-	-	-	-	1	-
Umbelliferae indet.	-	-	-	1	-	-	-	-	-	-	-	-	-
Polygonum aviculare agg.	-	-	-	-	2	-	-	-	-	-	-	-	1
Fallopia convolvulus	-	-	-	1	-	-	-	-	-	-	-	-	-
Rumex sp.	-	-	1	4	4	2	-	2	1	1	-	6	3
cf. Polygonaceae indet.	-	-	-	-	-	-	-	-	-	-	-	7	-
Polygonaceae/Cyperaceae	-	-	-	-	-	-	-	-	-	-	-	-	5
Veronica hederifolia	-	-	-	-	1	-	-	-	-	-	-	-	-
Sherardia arvensis	-	-	-	-	-	-	-	-	-	-	-	1	1
Galium aparine	-	-	-	-	-	-	-	-	-	-	-	-	1
Carex sp.	-	-	1	1	-	1	-	-	-	-	-	-	-
Lolium temulentum	-	-	-	-	-	-	-	-	-	-	-	4	-
cf. Lolium temulentum	-	-	-	-	-	-	-	-	-	1	-	1	-
Gramineae indet. (cmnd)	-	-	-	1	-	-	-	-	-	-	-	-	2
Gramineae indet.	-	-	-	7	4	1	-	-	1	1	1	4	11
Unidentified	1	-	-	-	2	2	-	-	-	-	-	6	1

Context:	1653/03/1	1655/01/1	1659/03/1	0042/00/2	0098/00/2	0110/01/1	0111/00/1	0136/03/1	0152/00/1	0209/00/1	0287/01/1	0430/02/1	0431/01/1
Sample volume (litres):	17	25	10	26	24	24	19	15	25	25	15	25	25
% analysed:	100	50	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	2	1	8	4	<1	<1	1	1	5	<1	4	1	1
Phase:	E5	E5	E5	A5	A5	A5	A5	A5	A5	A5	A5	D15	D15
Period:	E-M/L 15C	E-M/L 15C	E-M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C
Triticum dicoccum/spelta (gb)	-	-	-	-	-	-	-	-	-	-	-	-	1
Triticum spelta (gb)	-	-	-	-	1	-	-	-	-	-	-	-	1
Triticum spelta/aestivum (r)	-	2	-	-	-	-	-	-	-	-	-	-	-
Triticum sp. free-threshing	7	2	8	16	-	-	2	-	18	-	24	-	3
Triticum sp. (r)	-	-	-	-	1	-	-	-	-	-	-	-	-
Triticum sp.	16	3	6	23	1	2	-	6	41	4	29	1	13
cf. Secale cereale	-	-	-	1	-	-	-	-	-	-	-	-	-
Hordeum vulgare	-	-	3	5	-	-	-	-	-	-	2	-	1
Avena sp.	-	-	2	-	-	-	-	-	-	-	-	-	-
Cereal indet.	7	3	6	41	1	-	4	1	40	3	8	4	6
cf. Vicia faba	-	-	-	-	-	-	-	1	1	-	-	-	-
Pisum sativum (hilum)	-	-	-	-	-	-	-	-	1	-	-	-	-
Vicia/Pisum	-	2	-	-	-	-	-	-	-	-	-	-	1
Vicia/Pisum/Lathyrus	-	-	1	1	-	-	4	1	6	-	-	-	-
Ranunculus arvensis	-	-	1	-	-	-	-	-	-	-	-	-	-
Brassica rapa/nigra	-	-	1	-	-	-	-	-	-	-	-	-	-
Agrostemma githago	-	-	1	-	-	-	-	-	-	-	-	-	-
Chenopodium sp.	-	-	-	1	-	-	-	-	-	-	-	-	-
Chenopodiaceae indet.	-	-	1	-	-	-	-	-	-	-	-	-	-
Genista/Ulex type	-	-	1	-	-	-	-	-	-	-	-	-	-
Vicia tetrasperma	-	-	-	-	-	-	-	1	-	-	1	-	-
Vicia/Lathyrus	-	-	6	1	-	-	-	-	3	-	-	3	-
Trifolium type	-	-	-	-	-	1	-	-	-	-	-	-	-
Medicago/Melilotus/Large Trifolium	-	1	3	6	-	-	-	-	6	-	-	3	-
Leguminosae indet.	-	2	-	-	-	-	-	-	-	-	-	-	-
cf. Scandix pecten-veneris	-	-	1	-	-	-	-	-	-	-	-	-	-
Fallopia convolvulus	-	-	1	-	-	-	-	-	-	-	-	-	-
Rumex sp.	2	-	27	1	-	-	-	-	2	-	-	-	3
Polygonaceae/Cyperaceae	-	1	-	-	-	-	-	-	-	-	-	-	-
Galium aparine	-	-	1	-	-	-	-	-	1	-	-	-	-
Galium sp.	-	-	-	2	-	-	-	-	-	-	-	-	-
Compositae indet.	-	-	1	-	-	-	-	-	-	-	-	-	-
Eleocharis palustris/uniglumis	-	-	1	-	-	-	-	-	-	-	-	-	-
Carex sp.	-	-	-	-	-	-	-	-	1	-	-	-	-
cf. Lolium temulentum	-	-	-	-	-	-	-	-	-	-	1	-	-
Gramineae indet. (cmnd)	-	-	-	2	-	-	-	-	-	-	-	-	-
Gramineae indet.	-	1	4	1	-	-	-	1	5	-	-	-	-
Unidentified	1	-	2	-	-	-	-	-	2	-	-	2	-

Context:	0437/02/1	0454/04/1	0455/03/1	0503/01/1	0510/01/1	0512/01/1	0836/04/1	0930/05/1	0577/00/2	0666/00/1	1134/01/1	1194/01/1	1202/00/1
Sample volume (litres):	25	25	11	25	25	25	25	25	25	25	25	20	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	1	<1	22	3	2	5	2	18	1	2	<1	1	<1
Phase:	D15	D15	D15	D15	D15	D15	D15	D15	D25	D25	D25	D25	D25
Period:	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C	M/L 15C
Triticum dicoccum/spelta (spfk)	-	-	1	-	-	-	-	-	-	-	-	-	-
Triticum dicoccum/spelta (gb)	-	-	147	-	-	-	-	1	-	1	-	-	-
Triticum durum/turgidum (r)	-	-	-	1	-	-	-	-	-	-	-	-	-
Triticum spelta (r)	-	-	5	-	-	-	-	-	-	-	-	-	-
Triticum spelta (spfk)	-	-	1	-	-	-	-	-	-	-	-	-	-
Triticum spelta (gb)	-	-	57	-	-	-	-	-	1	-	-	-	-
Triticum cf. spelta	-	-	-	2	-	-	-	-	-	-	-	-	-
Triticum spelta/aestivum (r)	-	-	1	-	-	-	-	-	-	-	-	-	-
Triticum cf. spelta/aestivum (r)	-	-	-	-	-	-	-	4	-	-	-	-	-
Triticum aestivum s.l. (r)	-	-	-	-	-	-	-	1	-	-	-	-	-
Triticum cf. aestivum (r)	-	-	-	-	1	-	-	-	-	-	-	-	-
Triticum sp. free-threshing (r)	-	-	-	1	-	-	-	3	-	-	-	-	-
Triticum sp. cf. free-threshing (r)	-	-	-	-	-	1	-	-	-	-	-	-	-
Triticum sp. free-threshing	2	-	-	5	5	28	2	42	3	-	-	-	-
Triticum sp. (r)	-	-	-	-	1	-	-	9	-	-	-	-	-
cf. Triticum sp. (br)	-	-	-	1	-	-	-	-	-	-	-	-	-
Triticum sp.	6	1	6	36	14	50	16	83	2	22	-	5	-
Hordeum vulgare (r)	1	-	-	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare hulled	-	-	-	-	-	1	-	2	1	-	-	-	-
Hordeum vulgare	-	1	-	4	-	9	1	7	1	10	-	4	-
Avena sp.	-	-	-	-	-	-	1	-	-	-	-	-	-
Cereal indet.	8	1	10	30	13	32	23	272	7	20	1	9	2
Vicia faba	-	-	-	-	-	1	-	-	1	-	-	-	-
cf. Vicia faba	-	-	-	-	-	-	-	2	-	-	-	-	-
cf. Pisum sativum	-	-	-	-	1	-	-	-	-	-	-	1	-
Vicia/Pisum	-	-	-	-	1	-	-	-	-	1	1	-	-
Vicia/Pisum/Lathyrus	-	-	-	1	-	2	1	4	3	2	-	-	-
Ranunculus acris/repens/bulbosus	-	-	-	-	-	-	-	-	-	-	-	1	-
Brassica rapa	-	-	-	-	-	-	-	2	-	-	-	-	-
cf. Chenopodiaceae indet.	-	-	-	-	-	-	-	-	-	1	-	-	-
Vicia/Lathyrus	2	-	1	1	1	-	2	6	1	-	-	1	-
Trifolium type	-	-	-	-	-	-	-	-	2	-	-	-	-
Medicago/Melilotus/Large Trifolium	1	-	-	3	3	1	3	3	-	2	1	-	1
Rumex sp.	-	-	-	1	4	3	-	2	1	1	-	1	2
Polygonaceae/Cyperaceae	-	-	2	-	-	-	-	-	-	-	-	-	-
Galium palustre agg.	-	-	-	-	-	-	-	-	-	-	-	1	-
Carex sp.	-	-	-	-	-	-	1	1	-	-	-	1	-
Gramineae indet.	-	-	7	-	1	-	-	-	-	-	-	-	-
Tree/shrub (bud)	-	-	-	-	1	-	-	-	-	-	-	-	-

Context:	1233/00/1	1242/02/1	1468/01/1	0913/00/1	0027/00/1	0066/00/1	0066/00/2	0556/01/1	0925/00/1	0992/01/1	1130/00/1	1172/01/1	1199/00/1
Sample volume (litres):	25	25	25	25	24	20	25	17	25	25	25	25	15
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	4	2	4	<1	8	5	5	2	8	1	1	4	11
Phase:	D25	D25	D25	F5	A6	A6	A6	D26	D26	D26	D26	D26	D26
Period:	M/L 15C	M/L 15C	M/L 15C	M/L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C
Triticum cf. durum/turgidum (r)	-	-	1	-	-	-	-	-	-	-	-	-	-
Triticum spelta (gb)	1	-	1	-	-	-	-	-	1	-	-	-	-
Triticum sp. free-threshing	7	7	7	-	29	9	11	3	37	2	-	19	5
Triticum sp. (r)	1	-	-	-	-	-	-	-	-	-	-	-	-
Triticum sp.	26	24	21	-	83	31	38	12	57	8	6	22	51
Triticum/Secale	-	-	1	-	3	-	-	-	-	1	-	-	-
Hordeum vulgare (r)	-	-	1	-	-	-	-	-	-	-	-	-	-
Hordeum vulgare hulled	1	-	1	-	-	-	-	-	2	1	-	-	-
Hordeum vulgare	4	2	15	-	1	3	5	2	6	-	1	-	14
cf. Hordeum vulgare	-	-	-	-	5	-	-	-	-	-	-	-	-
Avena/Large Gramineae	-	1	-	-	1	-	-	-	-	1	-	-	-
Cereal indet.	28	13	38	1	26	26	45	13	79	3	9	33	77
Cereal/Large Gramineae (cmnd)	-	-	-	-	1	-	-	-	-	-	-	-	-
cf. Vicia sativa ssp. sativa	-	-	-	-	2	-	-	-	-	-	-	-	-
Vicia faba var. minuta	-	1	-	-	-	-	-	-	-	-	-	-	-
cf. Vicia faba var. minuta	-	-	-	-	-	-	-	-	1	-	-	-	-
Vicia faba	-	-	-	-	2	1	1	-	-	-	-	-	-
Pisum sativum	-	-	-	-	-	1	-	1	-	-	-	-	-
cf. Pisum sativum	-	-	1	-	-	-	-	-	-	-	-	-	-
Vicia/Pisum	-	1	-	-	11	-	-	1	-	-	1	-	-
Vicia/Pisum/Lathyrus	3	-	7	1	13	16	6	-	11	-	-	10	1
Caryophyllaceae indet.	-	-	-	-	1	-	-	-	-	-	-	1	-
Atriplex sp.	1	-	-	-	-	-	-	-	-	-	-	-	-
Vicia tetrasperma	-	-	1	-	-	-	-	-	-	-	-	-	-
cf. Vicia tenuissima	-	-	-	-	1	-	-	-	-	-	-	-	-
Vicia/Lathyrus	9	1	3	-	2	2	2	-	4	3	3	1	6
Medicago/Melilotus/Large Trifolium	10	1	5	-	7	2	4	-	3	-	-	6	2
cf. Scandix pecten-veneris	-	-	-	-	-	-	1	-	-	-	-	-	1
Fallopia convolvulus	1	-	-	-	-	-	-	-	-	-	-	-	-
Rumex sp.	4	-	4	-	-	2	-	-	7	-	-	1	-
cf. Rumex sp.	-	-	-	-	-	-	-	-	-	-	-	-	2
Polygonaceae/Cyperaceae	-	-	-	-	-	-	-	2	-	-	-	-	-
cf. Calluna vulgaris (immature flr)	-	-	-	-	-	-	-	-	-	-	-	-	1
Hyoscyamus niger	1	-	-	-	-	-	-	-	-	-	-	1	-
Solanum nigrum	-	-	-	-	-	-	-	-	-	-	-	-	1
Galium sp.	-	-	-	-	-	-	-	-	-	-	-	1	-
Anthemis cotula	-	-	-	-	-	-	1	-	-	-	-	-	-
Eleocharis palustris/uniglumis	2	-	-	-	-	-	-	-	-	-	-	-	-
Carex spp.	3	-	-	-	-	-	-	-	-	-	-	-	-
cf. Carex sp.	-	-	-	-	1	-	-	-	-	-	-	-	-
Gramineae indet. (cmnd)	-	-	-	-	2	-	-	-	-	-	-	-	-
Gramineae indet. (rhzm)	1	-	-	-	-	-	-	-	-	-	-	-	-
Gramineae indet.	-	1	-	-	3	2	4	1	2	-	-	1	3
Tree/shrub (bud)	-	-	-	-	1	-	-	-	-	-	-	-	-
Unidentified (?)	2	1	-	-	2	-	-	1	-	-	-	1	1

Context:	1203/00/1	1214/00/1	0909/00/1	0977/01/1	1143/00/1	1192/01/1	1679/01/1	0874/00/2	1180/00/1	0177/01/1	0378/01/1	0425/01/1	2222/00/1
Sample volume (litres):	25	25	25	25	25	25	25	25	13	24	25	25	25
% analysed:	100	100	100	100	100	100	100	100	100	100	100	100	100
Items per litre:	1	19	<1	1	14	2	4	9	4	<1	<1	<1	5
Phase:	D26	D26	E6	E6	E6	E6	E6	E7	E7	B2	B2	B2	H7
Period	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	L 15C	ca. 1497	ca. 1497	Medieval	Medieval	Medieval	E post-Med
Triticum dicoccum/spelta (gb)	-	-	-	-	2	-	-	-	-	-	2	4	-
Triticum spelta (gb)	-	-	-	-	-	-	-	-	-	-	4	3	-
Triticum aestivum s.l. (r)	-	1	-	-	-	-	1	-	-	-	-	-	-
Triticum sp. free-threshing (r)	-	-	-	-	-	-	-	-	1	-	-	-	-
Triticum sp. free-threshing	3	75	-	-	22	-	8	59	-	-	-	-	6
Triticum sp. (r)	-	-	-	-	-	-	1	-	-	-	-	-	-
Triticum sp. (spfk)	-	-	-	-	-	-	-	-	-	-	-	1	-
Triticum sp.	7	90	2	-	107	14	40	58	13	-	-	-	41
Triticum/Secale	-	-	-	-	-	1	-	-	-	-	-	-	-
Hordeum vulgare hulled	-	-	-	-	-	-	1	-	3	-	-	-	-
Hordeum vulgare	-	36	-	-	12	1	-	10	5	-	-	-	1
Avena sp.	-	2	-	-	1	-	-	-	-	-	-	-	-
Avena/Large Gramineae	1	-	-	-	-	-	-	-	-	-	-	-	-
Cereal indet.	8	146	4	2	134	24	28	60	14	1	-	1	57
Cereal/Large Gramineae (cmnd)	-	1	-	-	-	-	-	-	-	-	-	-	-
cf. Vicia sativa ssp. sativa	-	-	-	-	-	-	-	-	1	-	-	-	-
Vicia sativa/faba	-	-	-	-	-	-	-	-	1	-	-	-	-
Vicia faba var. minuta	-	-	-	-	-	4	-	-	-	-	-	-	-
Vicia faba	-	-	-	-	1	-	-	-	1	-	-	-	-
cf. Vicia faba	-	1	-	-	-	-	-	-	-	-	-	-	-
cf. Pisum sativum	-	1	-	-	-	-	-	1	-	-	-	-	-
Vicia/Pisum	-	-	-	-	-	-	1	-	-	-	-	-	-
Vicia/Pisum/Lathyrus	-	53	-	-	16	4	3	12	12	-	-	-	2
Ranunculus acris/repens/bulbosus	1	-	-	-	1	-	-	-	-	-	-	-	-
Ranunculus arvensis	-	-	-	1	-	-	1	-	-	-	-	-	-
Ranunculus flammula/reptans	-	-	-	-	1	-	-	-	-	-	-	-	-
Brassica cf. rapa	-	-	-	-	-	-	1	-	-	-	-	-	-
Brassica rapa/nigra	-	-	-	-	1	-	2	-	-	-	-	-	-
Brassica sp.	-	-	-	1	-	-	-	-	-	-	-	-	-
Raphanus raphanistrum (pdfr)	-	-	-	-	1	-	-	-	-	-	-	-	-
Cruciferae indet.	1	-	-	-	-	-	-	-	-	-	-	-	-
Agrostemma githago	-	1	-	-	1	-	-	-	-	-	-	-	-
Agrostemma githago (ctip)	-	-	-	-	-	-	1	-	-	-	-	-	-
Chenopodiaceae indet.	-	-	-	-	2	-	-	-	-	-	-	-	-
Vicia tetrasperma	-	1	-	-	-	-	-	-	-	-	-	-	-
Vicia/Lathyrus	6	6	2	3	10	3	2	5	3	-	-	1	12
Medicago lupulina	-	-	-	-	2	-	-	-	-	-	-	-	-
Medicago/Melilotus/Large Trifolium	6	5	1	-	7	3	6	2	-	-	-	-	8
cf. Leguminosae (pdfr)	-	-	-	-	1	-	-	-	-	-	-	-	-
?Rosaceae (internal)	-	-	-	-	-	-	-	-	-	-	-	2	-
Conium maculatum	-	-	-	-	4	-	-	-	-	-	-	-	-
Rumex sp.	4	15	-	3	8	1	3	1	-	-	-	-	-
Polygonaceae indet.	-	-	-	-	-	1	-	-	-	-	-	-	-
Polygonaceae/Cyperaceae	-	-	-	4	-	-	-	-	-	-	-	-	-
Corylus avellana (frg)	-	1	-	-	-	-	-	-	-	-	-	-	-
Hyoscyamus niger	-	27	-	-	-	-	-	-	-	-	-	-	-
Galium aparine	-	-	-	-	1	1	-	-	-	-	-	-	-
Galium sp.	-	2	-	-	-	-	-	-	1	-	-	-	-
Sparganium sp.	-	-	-	-	-	-	-	-	-	-	-	-	1
Carex sp.	-	-	-	2	1	2	-	4	-	-	-	-	-
cf. Lolium temulentum	-	-	-	-	-	-	1	-	-	-	-	-	-
Gramineae indet.	-	-	-	-	3	3	-	3	-	-	-	-	-
Unidentified (?)	-	1	-	2	-	-	-	-	-	1	-	-	-


N
5200
5100
3870
3880
<1 items per litre
1-5 items per litre
6-10 items per litre
>10 items per litre
unanalysed sample
0 10 50m
0 20 100ft

Figure 1