

Analysis of Carbonised Plant Remains

Laughanstown and Brenanstown, Dublin 18

15E0471

By Penny Johnston



Executive Summary

This report presents an analysis of the archaeobotanical material found in samples taken during excavations at Laughanstown and Brenanstown, Dublin 18 (15E0471).

A total of 13 samples were examined, with 12 containing charred seeds. A single seed was recovered from a sample taken from the Archaeological Area 5. The remaining samples were all relatively rich and were taken from Archaeological Area 2, where a charcoal clamp, pits, an irregular spread and a possible sub-circular structure were found.

Cereal grains were the most common seed types found, and the samples contained relatively few weed seeds. There was evidence of fragmentation and encrustation in almost all of the deposits of plant remains. This may suggest that these cereals were re-deposited, and it is unlikely that they were burnt *in situ*.

The cereal assemblage comprised mostly barley and oat grains, with much smaller quantities of wheat (possible free-threshing wheat) found. There were also very small amounts of rye, in quantities that suggest that its inclusion was incidental. Nevertheless, rye is quite an unusual find.

The general composition of the samples suggests an early medieval date, and the cereal assemblage is comparable to early medieval archaeobotanical material that has been recovered from sites in the nearby area. Radiocarbon dates for the site are pending.

1. Introduction

Excavations at Laughanstown and Brenanstown, Dublin 18 (15E0471) were conducted by David McIlreavy and Yvonne Whitty for Irish Archaeological Consultancy as part of a pre-development mitigation strategy at the Cherrywood Strategic Development Zone.

A total of 13 soil samples were examined to assess their archaeobotanical content and charred seeds were found in 12 of the samples (one from Archaeological Area 5 and 11 from Archaeological Area 2). The quantities of seeds found varied, from relatively small amounts (1 item) to large and statistically significant quantities (>1000 grains and seeds). This report outlines the methodology used and presents the results of archaeobotanical analysis.

2. Methodology

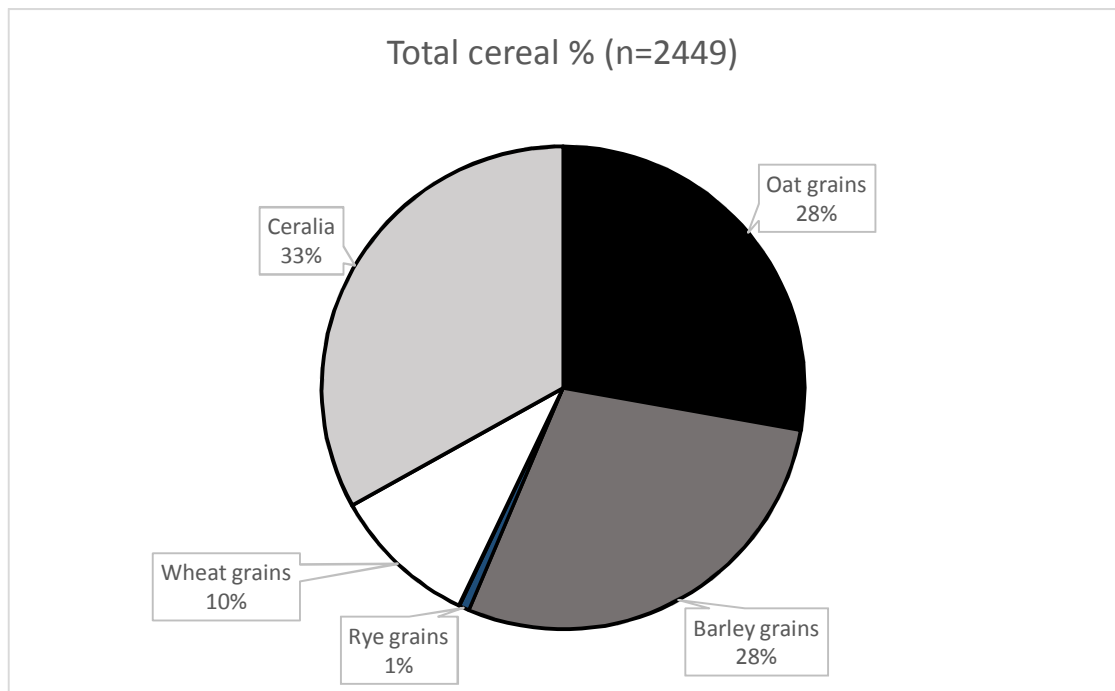
The samples were taken as bulk soil on site and were processed by flotation, work that was carried out by Irish Archaeological Consultancy. The retained floated material (the “flot”) was dried and stored in sealed plastic bags. A low-powered binocular microscope (magnification x4.8 to x56) was used to sort the flots, to ascertain whether charred seeds were present and to identify the remains found. Identification was carried out with reference to Jacomet’s (2006) cereal identification manual. Nomenclature and taxonomic order broadly follows (Stace, 1997). The results of analysis and some contextual details are presented in Tables 1, 2 and 3, at the end of this report.

3. Results

A total of 13 samples were examined and plant remains were found in 12 of these (see Table 1). One of these samples was taken from the Archaeological Area 5 (C18, S3) but this contained only a single indeterminate cereal grain.

The remaining samples were taken from Archaeological Area 2 and all but one of these (C192, S42) contained charred seeds. In some samples the quantities extracted from the samples were quite low; in C161 (S26), for example, just 17 plant items were counted. However, several of the remaining samples contained large quantities of seeds and grains, in particular C149 (S21), which contained almost 1000 cereal grains (or fragments of grains such as apical ends or embryo ends). Full details and identifications are presented in Table 3, at the end of this report.

Figure 1: Percentage cereal distribution in the assemblage from 15E0471



Barley was the most common identifiable grain type. It was numerically only slightly more prevalent than oats, with 692 barley grains counted, as compared to 673 oat grains (see Figure 1). However, the barley grains that were found were much larger (and therefore took up a much greater volume) than the oat grains.

The samples did not contain any floret bases from oats. This chaff is the only reliable way to distinguish oat grains by species. This means that it is not clear whether the oat grains in this sample were from a wild or a cultivated variety of oats. In many instances the grains were significantly smaller than the wheat and barley grains and several immature oat grains were also noted. It is therefore possible that the oats in these samples were not deliberately cultivated.

There were four samples with more than 100 identifiable cereal grains; C149 (S21), C150 (S22), C134 (S24) and C176 (S37). All of these were from Archaeological Area 2, with two derived from different fills within a pit (C148) and a further two samples from features within a possible post-built circular structure. The distribution of different cereal types in each of these samples was quite different (see Figures 2 and 3), even between the samples taken from the upper and basal fills of the same pit (S21 and S22).

Figure 2: Cereal counts in the richest samples from 15E0471

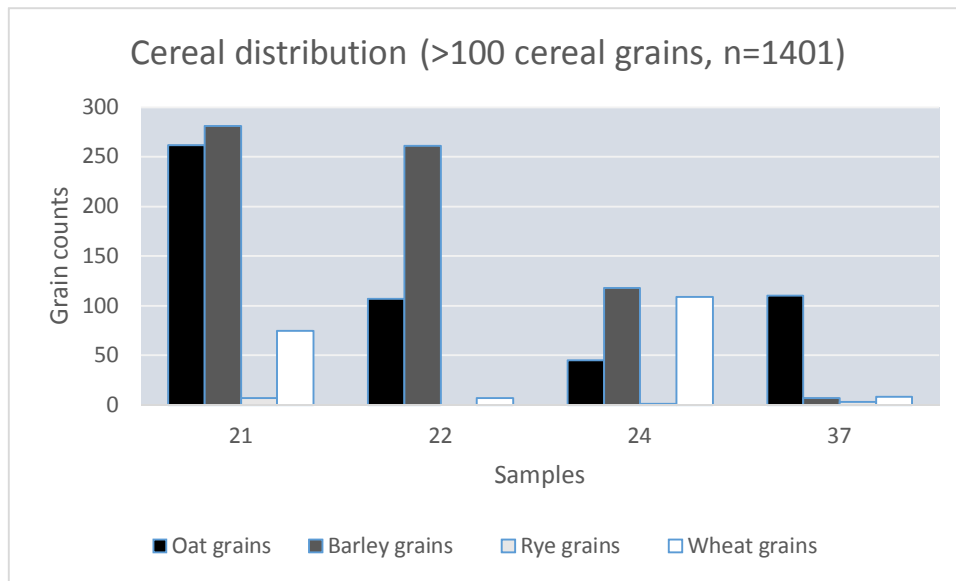
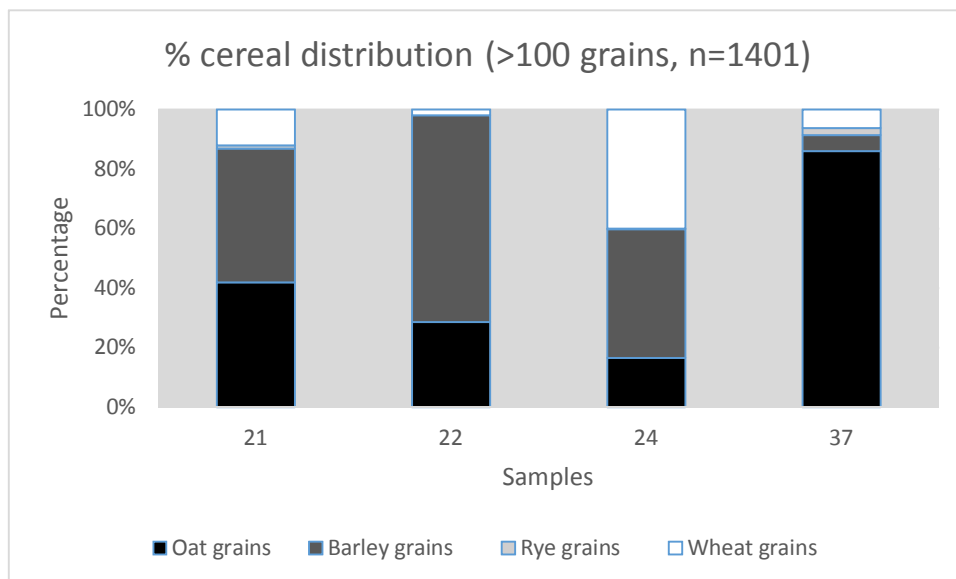


Figure 3: Cereal percentages in the richest samples from 15E0471

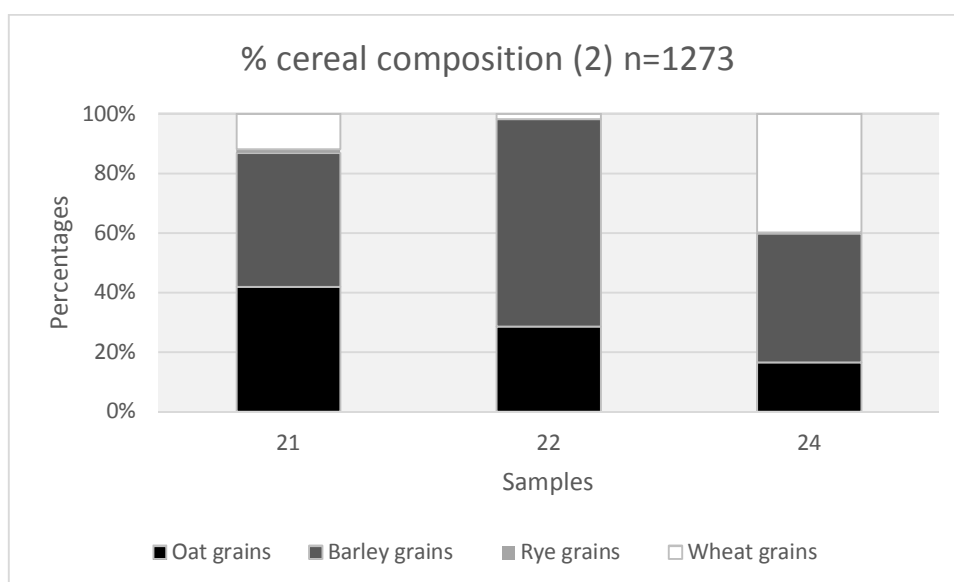


There were two further samples that had almost 100 cereal grains (S34 and S35) and both were from the middle of the site, from an irregular spread (C128) and a nearby pit (from C157, the fill of C156).

When combined, the results from these six richest samples represent activities associated with cereal grains (storage, processing, etc.) that were distributed across the site. The northernmost samples are from the pit C148 (S21 and S22). Both of these

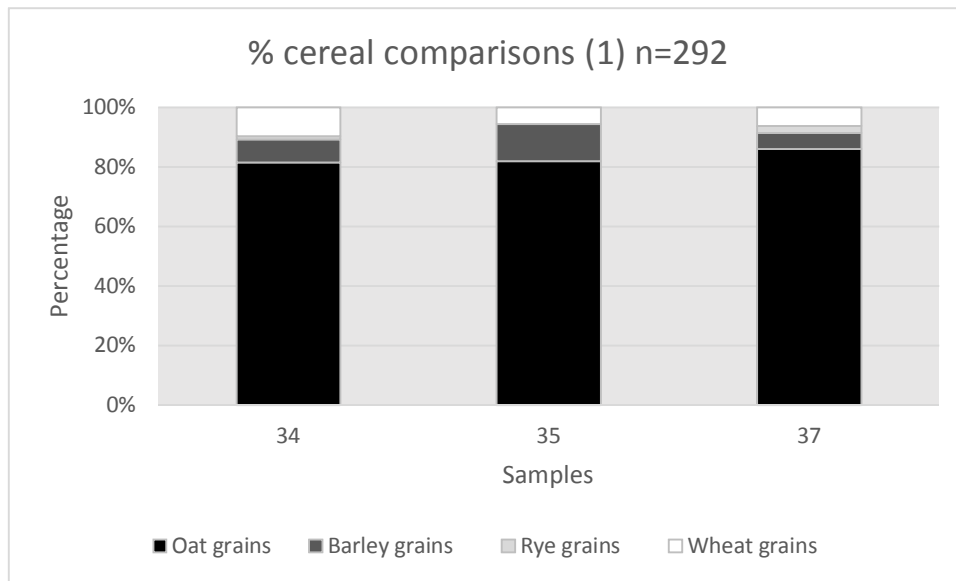
samples contain quite large proportions of barley, and quite high percentages of oat. Another sample from a posthole to the south-east (from the post-built structure C134, S24) also contained quite a high proportion of barley. However, in this case, rather than oat, there was a relatively large percentage of wheat in this sample (see Figure 4). The preservation quality in these samples was not good (see Table 1), and this suggests some redeposition of the plant material. Nevertheless, the comparisons between the cereal composition in these three samples suggest that although they may be re-deposited cereal assemblages, the cereals from these three samples appear to derive from different cereal caches.

Figure 4: Comparable cereal assemblages from the pit C148 (S21 and S22) & posthole C134 (S24)



The remaining three samples all contained quite large proportions of oat; these were from the fill of pit C156 (S35), from the irregular spread C128 (S34) and a posthole fill from the post-built structure C175 (S37). All three of these samples were relatively similar in terms of the percentage cereal composition (see Figure 5). There were indeterminate cereal grains in all of these samples, and there were also quite large amount of grain fragments that could not be counted, because they were not well-preserved (see Table 1). These are all indicators that the material in the sample may have been re-deposited and it is possible that the material in all of these three samples was derived from the same original material, hence the similarity of composition in the samples, as shown in Figure 5.

Figure 5: Comparable cereal assemblages from western activity in Area 2.

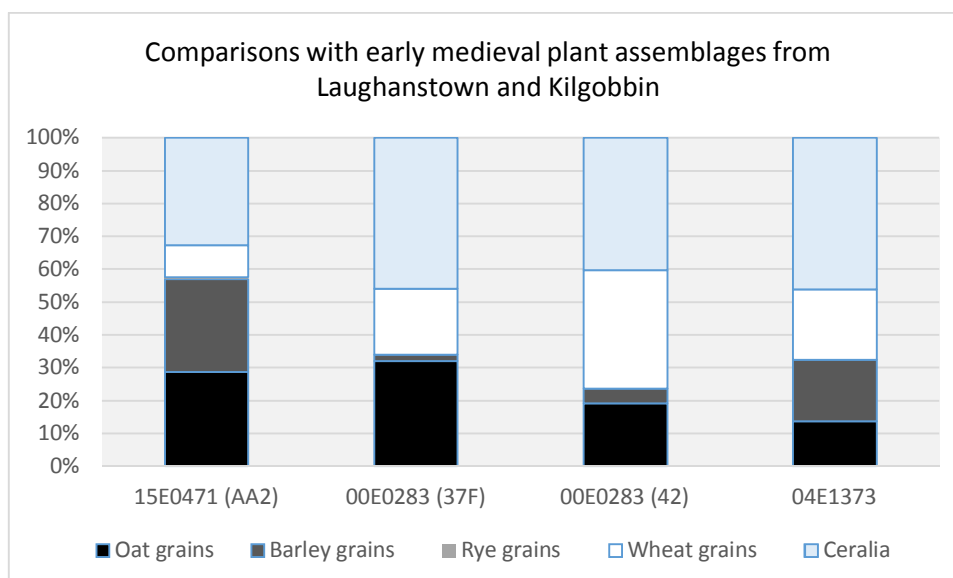


The wheat grains in these samples were generally not identifiable to species because of the poor quality of preservation present. However, where it was possible to distinguish beyond the genus level of identification, the wheat type appeared to be a naked type, meaning that it was free-threshing (and easier to process than glume wheats). Free-threshing wheat types are usually found in deposits from the early medieval period onwards. Rye and bread wheat (or free-threshing wheat in general) tend to be less common than oat and barley in the early medieval period, perhaps because they were more valuable (McCormick, Kerr, McClatchie, & O'Sullivan, 2011, p. 46). This is the interpretation that has been drawn from the text of an early law tract, *Bretha Déin Chécht*, where different grains are ranked according to social status, with bread wheat (a free-threshing wheat) and rye listed as being at the top of the hierarchy (Kelly, 1998, pp. 220-222). Identification of bread wheat and rye has therefore been suggested as an indication of social status at a site (Fredengren, McClatchie, & Stuijts, 2004, p. 176). Nevertheless, at Laughanstown and Brenanstown, these grains were present in much smaller quantities than oats and barley and there is not sufficient evidence from the plant remains alone to suggest that this assemblage represents high status crops.

We know that in the medieval period wheat was generally used for human consumption, and occasionally malted for ale, whereas rye was mostly used as a bread grain (Murphy & Potterton, 2010, p. 308). Barley was more versatile; it could be used as both human and animal food, and was often used for brewing, while oats were also used for human consumption, for brewing a somewhat inferior ale, and as fodder (Ibid., pp.309-313).

The general pattern of crop distribution across the Dublin region in the Middle Ages is that oat and barley, with small quantities of wheat, are found in the earlier period, whereas wheat is predominant in the later part of the period, particularly associated with areas settled and cultivated by the Anglo-Normans (Murphy & Potterton, 2010, p. 306). The entire assemblage from Laughanstown and Brenanstown is characterised by the prevalence of barley and oat in the samples, as well as quite high proportions of wheat and small quantities of rye. This may suggest an early medieval date. The general pattern in cereal distribution is comparable to early medieval assemblages from Leinster examined by McClatchie (see McCormick et al., 2011, pp. 52-54). If this assessment of date is correct, comparable archaeobotanical assemblages from the general area in south county Dublin includes early medieval material from archaeological activity adjacent to Kilgobbin church, where oat, barley and wheat grains were all common finds, but oat was predominant (Bolger, 2008, p. 111). Similarly, at Glebe ringfort (00E0758), small quantities of wheat, barley and oat were found, but in such small quantities that it was impossible to determine their relative importance (Johnston, 2003). Other excavations in Laughanstown have revealed quite extensive early medieval activity, including several drying kilns that were used to dry cereal grains (see Seaver, 2005). At Site 37F the plant remains assemblage contained mostly wheat and oat, with relatively little barley, with a similar assemblage found at Site 42 (Johnston, 2003).

Figure 6: Comparisons between early medieval cereal assemblages from Laughanstown and Kilgobbin in Dublin



When compared to these cereal assemblages (see Figure 6) the plant remains from 15E0471 are notable for two characteristics in particular; firstly, the relatively large proportions of barley grains in comparison to the other sites. Secondly, the occurrence

of rye, albeit in small amounts. Rye is rare in Irish archaeobotanical assemblages and, while in this particular assemblage it is present in such small amounts that its inclusion is likely to be incidental (perhaps caused by rye growing as a weed of a barley crop) it is nevertheless a characteristic that distinguishes these samples from others in the area. Although rye is known from prehistoric deposits, it is thought that it was taken into cultivation in the early medieval period in Ireland (McCormick et al., 2011, p. 45). It tends to be more common in deposits from the later medieval period and it was only recorded in 25% of the cereal assemblages examined by McClatchie for the Early Medieval Archaeology Project's examination of the archaeology of cereal production (Ibib., p.50). This means that the finds of rye from Laughanstown and Brenanstown, albeit present in small quantities, are relatively unusual.

4. Recommendations for storage and retention

The samples from Cherrywood currently comprise 13 flots (all with identifiable plant material already extracted) and several glass tubes of identified plant material from 12 of the flots (1 flot did not contain plant remains). The plant material is currently separated as follows:

- C18 (S3) identified seeds: 1 small tube (12 mm diameter x 50 mm length)
- C149 (S21) identified seeds: 4 larger tubes (22 mm diameter x 50 mm length), 1 small tube (12 mm diameter x 50 mm length), a small bag of unidentifiable cereal fragments
- C150 (S22) identified seeds: 2 larger tubes (22 mm diameter x 50 mm length), 3 small tubes (12 mm diameter x 50 mm length) NB: grains of hulled barley from this sample have been sent for radiocarbon dating
- C145 (S23) identified seeds: 1 small tube (12 mm diameter x 50 mm length) NB: two grains of wheat have been extracted from the sample and send for radiocarbon dating
- C155 (S24) identified seeds: 3 larger tubes (22 mm diameter x 50 mm length), 1 small tube (12 mm diameter x 50 mm length)
- C161 (S26) identified seeds: 1 small tube (12 mm diameter x 50 mm length)
- C130 (S31) identified seeds: 1 small tube (12 mm diameter x 50 mm length)
- C170 (S33) identified seeds: 1 small tube (12 mm diameter x 50 mm length)
- C128 (S34) identified seeds: 1 larger tube (22 mm diameter x 50 mm length)
- C157 (S35) identified seeds: 1 larger tube (22 mm diameter x 50 mm length)
- C176 (S37) identified seeds: 1 small tube (12 mm diameter x 50 mm length)
- C178 (S44) identified seeds: 1 small tube (12 mm diameter x 50 mm length)

These tubes of plant material do not take up a large amount of storage space and, as they contain carbonised seeds (with carbon being chemically inert) they do not require curation. Storage and retention of the tubes of extracted plant remains is recommended for verification and for future research purposes (such as follow-up radiocarbon dating, as well as isotopic and DNA research).

The flots are currently stored in sealed plastic bags and, as the charcoal they contain is chemically inert, they do not require curation. These will be sent to Dr Lorna O'Donnell, who will analyse and identify the charcoal, and who will make further recommendations for storage and retention of the flots.

5. References

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30 August 2018

Table 1: Charred plant remains, Laughanstown and Brenanstown, Dublin 18 (15E0471)

Area	Context	Sample	Contextual detail	Uncharred seeds	Description of sample contents	Material for C14
5.2	18	3	Fill of pit C17.	Chenopodiaceae seeds present. Likely modern.	Charred stalk material present.	
2	149	21	Upper fill of pit C148.	Absent.	Poor preservation. Many uncountable cereal fragments (no embryo ends or apical ends present). Wheat grains in this sample were possibly naked variety, but preservation was not adequate to identify this for certain.	
2	150	22	Basal fill of pit C148.	Absent.	Poor preservation. Many uncountable cereal fragments (no embryo ends or apical ends present). Oat grains were very small and look immature and possibly uncultivated (no floret bases present).	2 grains of hulled barley (probably straight).
2	145	23	Upper fill of charcoal clamp C120.	Absent.	Poor preservation. The seeds in this sample were very encrusted and looked re-deposited.	2 grains of wheat (possibly a naked variety).
2	155	24	Fill of posthole C134.	Absent.	Poor preservation. Many uncountable fragments of cereal grains with no apical ends or embryo ends. Oat grains are small and some are immature; these do not look like a cultivated variety. However, no oat floret bases were present.	
2	161	26	Fill of irregular pit C160.	Absent.	Poor preservation. Many cereal grains not counted because ends were not present. These grains were highly encrusted.	

Table 1 (continued): Charred plant remains, Laughanstown and Brenanstown, Dublin 18 (15E0471)

Area	Context	Sample	Contextual detail	Uncharred seeds	Description of sample contents	Material for C14
2	130	31	Fill of linear feature C129.	Absent.	Small quantities of charred seeds.	
2	170	33	Upper fill of posthole C140.	Absent.	Small quantities of charred seeds.	
2	128	34	Irregular spread.	Absent.	Many uncounted fragments of cereals (no embryo or apical ends present).	
2	157	35	Fill of pit C156.	Absent.	Charred seeds present.	
2	176	37	Fill of posthole C175.	Absent.	Many uncounted fragments of cereals (no embryo or apical ends present).	
2	192	42	Fill of posthole C136.	Absent.	No charred seeds present in this sample.	
2	178	44	Fill of drip gully C177.	Absent.	Some unidentifiable fragments of cereals not counted as no embryo and apical ends were present. Grains were encrusted.	

Table 2: Identified charred plant remains, Laughanstown and Brenanstown, Dublin 18 (15E0471) - Non- cereal and grass items

Context	18	149	150	145	155	161	130	170	128	157	176	178
Sample	3	21	22	23	24	26	31	33	34	35	37	44
Hazel nut shell fragments (<i>Corylus avellana</i> L.)		3		1								
Indeterminate seeds from the goosefoot family (Chenopodiaceae)												1
Probable Black bindweed (<i>Fallopia</i> cf <i>convolvulus</i>)			1	1								
Indeterminate seeds from the Knotgrass family (Polygonaceae)		1										
Wild radish (<i>Raphanus raphanistrum</i> L.) capsule										3		
Possible wild radish (<i>Raphanus raphanistrum</i> L.) capsule (very encrusted)				1								
Possible haw stones (<i>Crataegus monogyna</i> Jacq.)									1			
Indeterminate seeds from the Legume family (Fabaceae)						1			1			
Flax seed fragments (<i>Linum</i> L. species)		1										
Plantain (<i>Plantago</i> L. species)		1										
Cleavers (<i>Galium aparine</i> L.)												1
Indeterminate seeds from the sedge family (Cyperaceae)		1										
Indeterminate weed seeds		5				1						

Table 3: Identified charred plant remains, Laughanstown and Brenanstown, Dublin 18 (15E0471) - Cereal and grass items

Context	18	149	150	145	155	161	130	170	128	157	176	178
Sample	3	21	22	23	24	26	31	33	34	35	37	44
Oat grains (<i>Avena</i> L. species)		103	68	5	16		7	8	38	33	78	
Oat grain apical ends (<i>Avena</i> L. species)		144	39	4	29		3	5	37	26	32	
Oat grain embryo ends (<i>Avena</i> L. species)		6	4		3		1		4	2	4	
Possible oat grains (cf <i>Avena</i> species)		15				4	4					3
Hulled barley grains (<i>Hordeum vulgare</i> L.) indeterminate type		56	48		10			1		4	1	
Hulled barley grains (<i>Hordeum vulgare</i> L.) probably straight type		20	18						2			
Hulled barley grains (<i>Hordeum vulgare</i> L.) probably twisted type		22	8		32							1
Barley grains of indeterminate species (<i>Hordeum</i> species)		165	187	1	76				5	5	6	1
Possible barley grains (cf <i>Hordeum vulgare</i>)		18		3		1	1					
Rye grains (<i>Secale cereale</i>)					1			1				
Possible rye grains (cf <i>Secale cereale</i>)		7		1					1		3	3
Free threshing wheat (<i>Triticum aestivum</i> L./ <i>turgidum</i> Desf./ <i>durum</i> L.)					37							
Probable free threshing wheat (<i>Triticum</i> cf <i>aestivum</i> L./ <i>turgidum</i> Desf./ <i>durum</i> L.)				10	49		1		5			
Wheat grains (<i>Triticum</i> L. species)		53	5	10	23	3		2	4	4	8	
Possible wheat grains (cf <i>Triticum</i> spp.)		22	2									
Indeterminate cereal grains (Ceralia)	1	364	239	5	113	7	5	14	21	9	6	17
Rachis internodes from indeterminate cereals		2								3		
Indeterminate grass seeds (Poaceae)		20	1		4							