

## TWO EARLY RYE FINDS FROM THE NETHERLANDS

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### SUMMARY

Charred rye grains recovered from two settlement sites indicate that in the Netherlands, *Secale cereale* was grown by native farmers in the first centuries A.D. and probably already in the last centuries B.C.

### 1. INTRODUCTION

Rye, *Secale cereale* L., is a secondary cultivar. Primary crop plants, for instance barley and wheat, were taken into cultivation inside their Near Eastern natural distribution areas. After they had been domesticated, barley and wheat were introduced by prehistoric man to large parts of Asia, Africa and Europe, where they adapted themselves to climatic and edaphic conditions which differ considerably from those in the habitats of their wild progenitors. The same applies to various other Old World crop plants, such as linseed, pea and lentil. Rye, on the other hand, was not domesticated in its area of natural distribution in the mountains of central and eastern Turkey, northwestern Iran and Transcaucasia (ZOHARY 1971). Prior to its domestication rye was inadvertently dispersed by prehistoric agriculturists as a field weed.

So far, the earliest finds of grains and grain imprints of *Secale* are from southern Poland and eastern Austria and are attributed to the Bandkeramik culture, which is radiocarbon dated to 4400–4000 B.C. (cf. KLICHOWSKA 1975, WERNECK 1961). Because of the small numbers of grains and grain imprints of rye found in the Bandkeramik sites concerned, there remains some doubt as to whether these finds may be considered as evidence of rye cultivation. Distinct indications of the cultivation of *Secale* in central Europe are provided by Bronze Age finds (c. 1800–1500 B.C.) of charred rye grains in Czechoslovakia (TEMPER 1966).

As for western Europe, the earliest rye grains are reported at the Early Iron Age sites of Winkelbury, Maiden Castle and Fifiel Bavant in southern England, to be dated to the fourth to second centuries B.C. (HELBAEK 1952, 1971). In these and in other Iron Age charred seed finds in which rye is represented, the proportion of this species is very low. As a striking example HELBAEK (1971) mentions the find at Østerbølle in Jutland (first century A.D.) which yielded 240 rye grains amongst c. 250,000 barley grains, that is about 0.1% *Secale*. These finds suggest that rye occurred only as an impurity in

grain fields. Helbaek emphasizes that in Iron Age times there would have been no question of the intentional growing of rye by the native farmers of western Europe.

According to HELBAEK (1971) the earliest evidence for rye cultivation in western Europe comes from Roman garrison sites from the first and second centuries A.D. As rye bread was disdained by the Romans, Helbaek suggests that rye was used for making beer. This assumption is supported by the find of a deposit of spelt (*Triticum spelta*) and rye "in a state of two to three days' germination – in other words malt" at the Roman legionary fortress of Isca, in Wales (HELBAEK 1964). Helbaek's theory of how the Roman legionaries became acquainted with the practice of making beer out of rye is undoubtedly ingenious, but not very convincing.

Be this as it may, according to HELBAEK (1971), Roman legionaries cultivated rye, or at least had it grown for them. On the other hand, the native farmers of western Europe would not have accepted rye as a crop plant until the middle of the first millennium A.D. In this connection, two new rye finds from the Netherlands may be of some interest.

## 2. EDE-VELDHUIZEN

In 1968 remains of a native settlement were excavated under the direction of W.A. van Es at Veldhuizen, now a residential quarter, a few kilometres west of the old centre of Ede (*fig. 1*). The settlement remains were situated on a coversand ridge and sealed off by arable soil ("es" soil) to a thickness of 1 m at most. In the excavation, ground plans of rectangular, three-aisled farm houses, up to 40 m long and 8 m wide, came to light. Further, remains of sheds, granaries, wells and fences were unearthed. Roman finds, including fragments of roof-tiles, date the site from the middle of the second century to the beginning of the fifth century A.D. (VAN ES 1969, in the press).

One charred grain sample (find number 221) was recovered from a pit, probably a post-hole. The results of the analysis of this sample appear in *table 1*. By far the majority of the charred seeds and fruits of the Ede-Veldhuizen sample is made up of *Secale cereale*. In consequence of serious deformations caused by the carbonization the dimensions have been taken for only a few rye grains (*table 3*). Some rather well preserved grains are depicted in *fig. 2*. In addition to the grains, a fairly large number of rachis internodes of *Secale* was found. The presence of the rachis internodes indicates that an unthreshed rye supply had caught fire. The rye must have been grown by the inhabitants of the site and had not been imported from elsewhere. In the latter case clean grains would have been traded.

The other crop plant species represented in the Ede-Veldhuizen sample, millet and barley, probably occurred as an impurity in the rye field concerned and could point to crop rotation. In spite of the bad state of preservation, a reliable species identification was possible for *Setaria glauca* because in some specimens remains of palea and lemma with the distinct transverse wrinkling

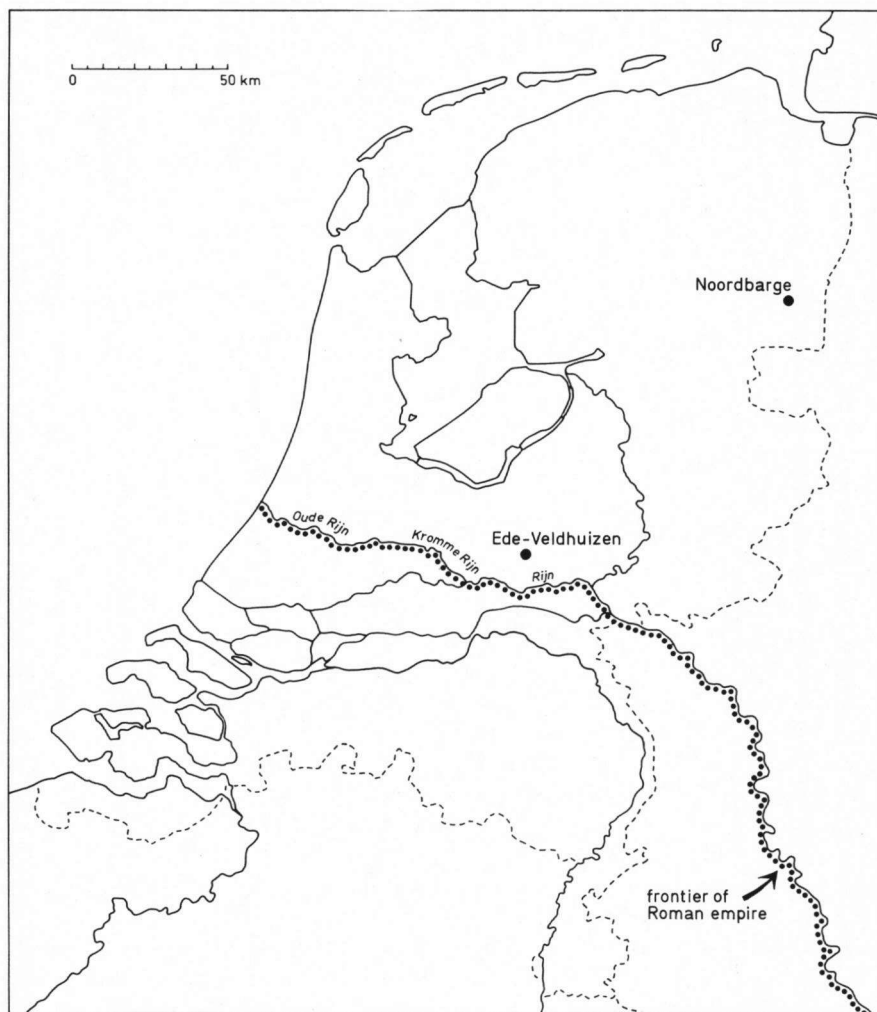


Fig. 1. Location map of the sites discussed in this paper, with the border of the Roman empire (from 47 to c. 400 A.D.).

are still adhering to the grains.

Although the charred grain sample most likely belonged to the settlement of the Roman Iron Age, a younger date could not completely be ruled out. In this connection it should be mentioned that a biconical Frankish pot, to be dated to the 6th or 7th century A.D., had been found in the area of the settlement. To obtain certainty about the age of the sample most of the rye grains were sacrificed to a radiocarbon determination. The radiocarbon date of  $1830 \pm 50$  B.P. (c. 120 A.D.; GrN-7270) shows that the sample is certainly not younger than the settlement, but that, on the contrary, it must have been deposited in an

Table 1. Numbers of charred seeds in Ede-Veldhuizen 221.

<i>Secale cereale</i>	c. 1100
<i>Panicum miliaceum</i>	c. 45
<i>Hordeum vulgare</i>	4
<i>Hordeum vulgare</i> var. <i>nudum</i>	1
<i>Setaria glauca</i>	19
<i>Polygonum lapathifolium/persicaria</i>	2½
<i>Rumex acetosella</i>	1
<i>Chenopodium album</i>	1
<i>Stellaria media</i>	1
<i>Spergula arvensis</i>	1
cf. <i>Potentilla erecta</i>	1
<i>Scirpus lacustris</i>	1
<i>Eleocharis palustris</i>	1
<i>Cenococcum geophilum</i> (sclerotia)	c. 70

early phase of the habitation. In this connection it should be mentioned that the C<sup>14</sup> determinations of bristlecone-pine tree rings and of samples of historically known age do not point to considerable deviations between radiocarbon years and calendar years for the period covering the last centuries B.C. and the first centuries A.D.

There can be no doubt that rye was grown by the inhabitants of the Ede-Veldhuizen site, at least during an early phase of the habitation. On the other hand, one could wonder as to how far the rye cultivation was independent of the Romans. In this connection one should take into consideration that the Ede-Veldhuizen settlement was situated only 10 kilometers north of the Rhine, which constituted the border of the Roman empire from 47 to c. 400 A.D. (*fig. 1*). One could imagine that the inhabitants of the site had adopted the rye cultivation from the legionaries in the frontier garrisons, or even that they grew rye for the Roman soldiers (see above). That there were contacts with the Romans is shown by the Roman roof-tiles which were found in the settlement. Moreover, since c. 100 A.D. it was the policy of the Roman government to keep a check on the free tribes on the opposite side of the frontier (cf. VAN ES 1972: 44-45), implying fairly close contacts. From the above it will be clear that the Ede-Veldhuizen find may not be considered as proof of a native tradition of rye cultivation in the Netherlands in the first centuries A.D.

### 3. NOORDBARGE

In 1972, 1973 and 1974 excavations were carried out at "De Hooge Loo" near Noordbargo, municipality of Emmen (*fig. 1*), under the direction of O.H. Harsema and P.B. Kooi. The excavated terrain adjoins the area which was investigated by A. E. van Giffen in 1948. In addition to an urnfield from the Late Bronze to the Early Iron Age (9th to 5th centuries B.C.), settlement remains of the late Pre-Roman Iron Age to the Roman Iron Age were unearth-

Table 2. Charred seeds from Noordbarge.

Sample number	1004	856	247	312	338	833	952	957	999	307	308
Origin of sample	post-hole	entrance	sunken	post-hole	post-hole	sunken	sunken	wall	post-hole	post-hole	post-hole
Phase	II	III(?)	IV	IV	IV	IV	IV	IV	IV	IV	IV
<i>Secale cereale</i>	c.10	1	c. 28	c.15	c. 6	2	4	1	c.10	c.290	c. 50
<i>Hordeum (vulgare)</i>	c. 2	2	c. 5	5	.	2	1	.	.	.	.
<i>Avena (sativa)</i>	.	.	.	½	.	2	.	.	3	.	.
<i>Panicum miliaceum</i>	1	2	4	2½	4	c.14	.	1	12	c. 30	c.105
Sum crop plant seeds	13	39%	5	42%	37	34%	23	79%	10	16%	20
<i>Bromus mollis/secalinus</i>	½	.	2	.	.	½	1	.	1½	2½	.
<i>Echinochloa crus-galli</i>	.	1	.	.	.	1	.	.	.	1	.
<i>Chenopodium album</i>	.	3	c. 26	.	c.12	.	.	.	2	1	2
<i>Atriplex hastata/patula</i>	.	1	.	.	.	.	1	2	.	.	.
<i>Spergula arvensis</i>	9	1	12	1	6	6	1	.	23	.	1
<i>Stellaria media</i>	.	.	.	.	5	.	.	.	.	.	.
<i>Rumex acetosella</i>	8	.	18	.	20	6	1	.	22	4	1
<i>Rumex cf. crispus</i>	.	.	3	1	1	.	.	.	1	.	.
<i>Polygonum lapathifolium</i>	.	.	1	1	2	.	.	.	4	9	1½
<i>Polygonum aviculare</i>	.	.	1	.	.	.	.	.	.	.	.
<i>Polygonum convolvulus</i>	.	1	1	.	.	.	.	.	.	.	.
<i>Solanum nigrum</i>	.	.	.	.	.	.	.	.	1	.	.
<i>Plantago lanceolata</i>	1	.	.	.	.	.	.	.	.	.	.
<i>Potentilla cf. erecta</i>	.	.	.	.	.	.	1	.	.	.	.
<i>Pyrus malus</i>	.	.	.	.	.	½	.	.	.	.	.
<i>Raphanus raphanistrum</i>	.	.	1	.	.	.	.	.	.	.	.
<i>Cruciferae indet.</i>	.	.	3	.	.	.	.	.	.	.	.
<i>Eleocharis palustris</i>	.	.	.	.	1	.	.	.	.	.	.
cf. <i>Carex</i>	.	.	.	.	.	.	.	.	.	½	.
Unidentified seeds	2	.	3	3	5	3	.	.	2	.	2
Sum other seeds	20½	61%	7	58%	71	66%	6	21%	52	84%	17
Total numbers of seeds	33½	12	108	29	62	37	9	4	56½	69%	18
<i>Cenococcum geophilum</i> (sclerotia)	.	.	22	4	c.550	.	.	1	81½	338	162½

ed. The settlement consisted of long houses, predominantly of the three-aisled type, sunken huts, granaries and fences (HARSEMA in the press). On the basis of the horizontal stratigraphy (intersecting house-plans) and of the orientation, distribution and typology of the houses, five phases of habitation are distinguished by Harsema. On account of two radiocarbon measurements, phase III may be dated to the second century B.C. It is not unlikely that phase II is contemporary with phase III; both phases which are older than phase IV are situated in different parts of the area. Consequently, phase II could likewise be of the second century B.C. Radiocarbon measurements and comparisons with other sites suggest an age of c. 100 B.C. to 100 A.D. for phase IV.

So far, nearly 100 samples have provisionally been examined for charred seeds and fruits. A fairly large number of crop plants could be established: *Triticum dicoccum*, *Hordeum vulgare*, *Avena sativa*, *Secale cereale*, *Panicum miliaceum*, *Linum usitatissimum*, *Camelina sativa* and *Vicia faba* var. *minor*. Large numbers of seeds and fruits of cultivated plants were found in only a minority of the samples. In addition to the crop plants mentioned above, various weeds, such as *Spergula arvensis*, *Polygonum lapathifolium*, *Rumex acetosella* and *Chenopodium album*, are represented. A publication of the full results of the botanical examination is scheduled for later, together with the report on the excavation.

Rye grains were found in samples attributed to phases II, III(?) and IV. The results of the analyses of the samples in which rye is represented are shown in table 2. One sample with some questionable rye grain fragments is left aside here. From table 2 it is clear that only in samples 307 and 308 do rye grains occur in somewhat larger numbers, while sample 247 with c. 28 rye grains holds an intermediate position. For that reason samples 307 and 308 will be discussed first. In addition to rye, one other crop plant, millet, is represented in samples 307 and 308. Measurements of rye grains from sample 307 are shown in table 3.

In samples 307 and 308 rye grains not only occur in fairly large numbers, but also the share of *Secale* in the total numbers of seeds in these samples is quite considerable, viz. 86% and 31% respectively. Consequently, samples 307 and 308 may be considered as conclusive evidence of rye cultivation. It is perhaps superfluous to mention that very probably rye and millet have neither

Table 3. Dimensions in mm for *Secale cereale* from Ede-Veldhuizen and Noordbarge.

		length	width	thickness
Ede-Veldhuizen Nr. 221 n = 10	min.	4.3	2.0	1.6
	mean	5.05	2.31	1.98
	max.	5.6	2.7	2.3
Noordbarge Nr. 307 n = 32	min.	3.9	1.6	1.5
	mean	4.99	2.14	1.95
	max.	6.2	2.5	2.4

been grown nor stored as mixed crops. The mixing must have taken place after the carbonization. The field weed seeds may be a later addition to the crop plant seeds, although, on the other hand, it is possible that some of them had escaped the cleaning of the crop and were present in the original rye and millet supplies.

As for the archaeological context of samples 307 and 308, the following should be remarked. The samples are both from the fill of former post-holes. The post-hole from which sample 308 was taken was of an upright. This upright formed part of the ground-plan of house 7 which belongs to phase IV. The post-hole from which sample 307 originates was situated inside house-plan 7. The function of the post concerned is not quite clear. It could have been a post in the central axis of the house. One could possibly doubt whether this post belonged functionally to house 7, but there are no other structures of which it could have formed part. In the area of house 7 no traces of later (medieval) habitation were found.

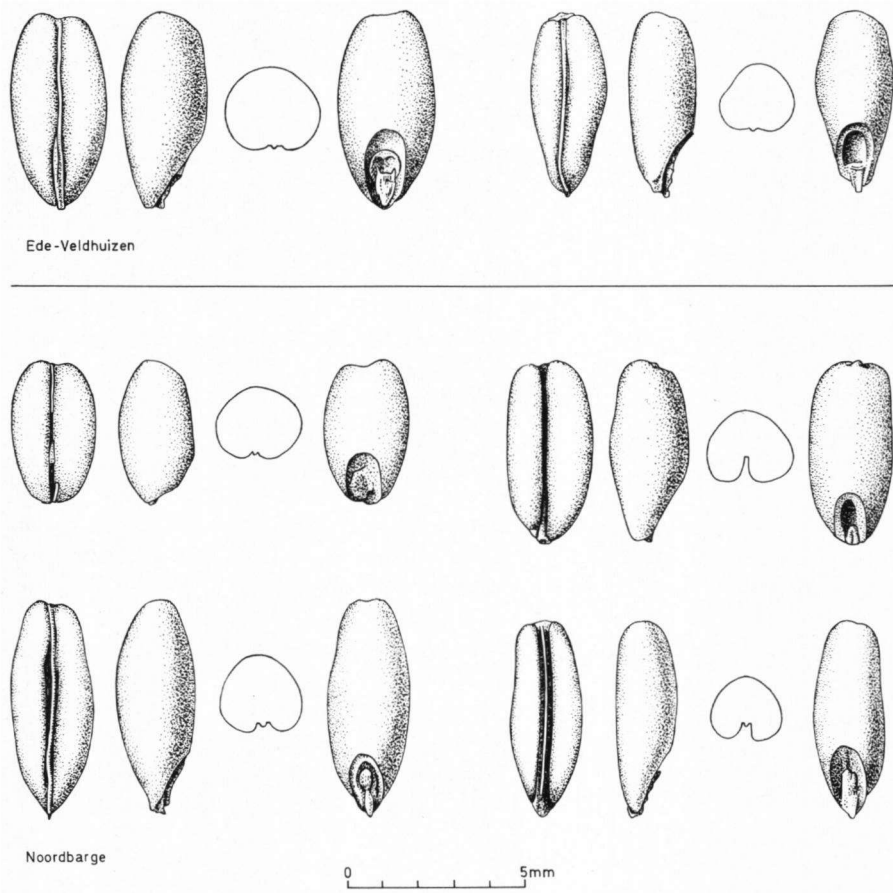


Fig. 2. Charred grains of *Secale cereale* from Ede-Veldhuizen and Noordbarg.

Thus, samples 307 and 308 demonstrate convincingly that rye was cultivated by the Noordbarga farmers at least during some time in the fourth phase of habitation. However, what significance may be attributed to the usually small numbers of rye grains in the other samples of *table 2*? Could the rye grains concerned have originated from plants which occurred as an impurity in grain fields, that is to say from before or possibly after the time of the intentional growing of *Secale*? This would imply either that samples 307 and 308 are younger than all other samples listed in *table 2* or that the rye cultivation at Noordbarga was only of short duration and was given up afterwards.

In connection with the question whether or not the samples other than 307 and 308 could point to rye cultivation, the following can be remarked. The proportion of *Secale* among the crop plant seeds in the samples concerned is fairly high to high, viz. from 10% in sample 833 to 80% in sample 952. This would plead in favour of rye cultivation. On the other hand, in these samples the proportion of field weed seeds is generally much higher than in samples 307 and 308 (*table 2*). This could indicate that we are dealing here mainly with the refuse of crop cleaning. In that case the relatively high proportion of rye among the crop plant seeds could suggest that the rye grains had deliberately been removed from the crop. From the above it will be clear that the samples other than 307 and 308 do not provide conclusive evidence for the cultivation of rye. This implies that it is not entirely certain that rye was already grown during phases II and III (samples 1004 and 856) and during the whole of phase IV.

As for the question as to how far the rye cultivation at Noordbarga could have been induced or stimulated by the Romans, the following can be remarked. The Roman occupation of the north of the Netherlands was of rather short duration, viz. from 12 B.C. to 28 A.D., when the Romans largely or completely withdrew from the area after the rebellion of the Frisians (cf. VAN ES 1972: 34). In 47 A.D. the Rhine, i.e. the line formed by the rivers Oude Rijn, Kromme Rijn and Rijn (*fig. 1*), became the official frontier of the Roman empire in the present-day Netherlands. Roman influence on daily life in the north of the Netherlands in the period 12 B.C.-28 A.D. must in general have been of limited extent. Occupation forces were encamped, taxes were imposed and auxiliary troops were recruited among the native inhabitants. Not only the guarding, but also the administration was in the hands of the military. There was no question of a Romanization of the area.

If already in the second and first centuries B.C. (phases II and III, and first half of phase IV) rye was cultivated by the inhabitants of the Noordbarga settlement, this must have been independent of any Roman influence. However, if only samples 307 and 308 would point to rye growing, one could wonder whether the cultivation of rye at Noordbarga had something to do with the presence of the Romans in the north of the Netherlands. For sample 308 a radiocarbon date of  $1930 \pm 35$  B.P. (c. 20 A.D.; GrN-7251) was obtained. This implies that samples 307 and 308, which are both from house 7, could very well date from the period of the Roman occupation. As has already been remarked the radiocarbon date of 1930 B.P. very probably does not differ



much from the calendar date of the sample concerned. Neither literary sources nor archaeological evidence seem to point to a long-lasting presence of Roman occupation forces in the Noordbarge area. Consequently, one may exclude the possibility that the Noordbarge farmers raised rye for Roman legionaries. The inhabitants of the site must have grown rye for their own use and of their own free will. The impetus to the cultivation of rye may, in one way or another, have come from the Romans. It should be stressed that the latter suggestion only makes sense if, indeed, rye cultivation had started in the period of the Roman occupation.

In summary it may be remarked that the Noordbarge charred grains provide evidence for the cultivation of rye in the first century A.D. and probably already in the second and first centuries B.C. This conclusion implies that, contrary to Helbaek's opinion, rye was accepted as an equal to other crop plants by native farmers of western Europe already before medieval times, be it in all probability only locally or only by certain tribes.

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