

THE PROVISIONING OF THE ROMAN ARMY IN THE RHINE DELTA BETWEEN C. AD 40 AND 140

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INTRODUCTION

Between AD 40 and 70, a string of about ten, quite small fortifications were built on the southern levee of the river Rhine from Vechten down to the North Sea, covering a total distance of some 60 kilometres (Fig. 1). Opinions differ as to why these fortifications were built. Some believe that the auxiliary forts marked the border of the Roman Empire even at the time of building, whereas others are of the opinion that the southern part of the Netherlands was not part of the Empire until the end of the first century. This debate was one of the reasons for starting a research project in 2004 entitled “A sustainable frontier? The establishment of the Roman frontier in the Rhine delta”¹. Within this research project, data collected from excavated auxiliary forts in the study area will be compared with each other in order to develop new ideas about the Romans’ military presence in the Rhine delta. Part of the scheme is a project which deals with the way the food supply to the Roman army was organized², since a well-organized food supply is essential for a successful occupation (see, for example, Groenman-Van Waateringe 1980; 1989).

From archaeological and historical sources it is known that the main vegetable food products for the Roman army were bread, biscuits, porridge, fruits, wine and olive oil (Davies, 1989: 187-206; Dickson, 1989: 141-144). Of these, wine and olive oil were imported as final products, whereas bread, biscuits and porridge were prepared at the forts from ingredients that were transported to the fortifications. The main ingredients for bread, biscuits and porridge are bread wheat (*Triticum aestivum*), emmer wheat (*Triticum diccocon*), spelt wheat (*Triticum spelta*) and

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² The research team dealing with food supply consists of C. Cavallo (University of Amsterdam) and M. Dütting (Hazenberg Archeologie Leiden), who are responsible for studying the supply of animals and animal products, and the author, who deals with the army’s provisioning with vegetable foodstuffs.

hulled barley (*Hordeum vulgare*). Although many more vegetable foodstuffs were used, I shall concentrate on the provisioning of the fortifications with staple foods, cereals in particular. The main questions I am addressing are these:

1. Where did the food products come from,
2. How much was needed,
3. How were these products transported to the fortifications?

To obtain more information about the amount of cereals needed, we first need to know more about the fluctuations in size of the military population during the first and second centuries³. Also the transport facilities have not yet been closely investigated, because we first need to know where the food products came from. It is this first question that is the subject of this paper.

LANDSCAPE

Among many factors which must have influenced the food supply to the Roman army, such as food culture and the military way of organizing food supply, there is also the relation between food supply and the surrounding landscape. In general the Rhine delta around these fortifications was a wet area. To the west is the coastal zone with sandy beach barriers. The sandy beach barriers were the high and dry places that people could live on. Between the beach barriers were salt- and fresh-water marshes. In the central part of the study area the river Rhine passed through a wet peat area. Apart from the beach barriers, the levees of the river Rhine and those of smaller tributaries were high and dry places that could be inhabited. In the eastern part of the study area, people lived on the levees of the river Rhine and also on stream ridges. In this type of landscape there certainly were possibilities for growing cereals, but the high water table meant that the area suitable for arable fields was limited. For this reason, it is assumed that cereals for the Roman army were imported from what now is southern Belgium, northern France and the German Rhineland (Bloemers, 1983; Whittaker, 1994).

AD 40–70

For this preliminary study I split up the research period into two parts: AD 40–70 and AD 70–140. First we shall look at the period prior to AD 70. This is when the fortifications were built. As said before, it remains unclear whether at this time the river Rhine was already the northern border of the Roman Empire. Archaeobotanical evidence is available from four military locations⁴ and ten rural settlements of which three were situated northwest of the Rhine delta⁵.

³ Cf. the paper by M. Polak in this volume.

⁴ Valkenburg (Van Zeist, 1968; Noordam & Pals, 1987; Pals *et al.*, 1989), Alphen aan de Rijn (Kuijper & Turner, 1992; Kooistra, 2004), Woerden (Brinkkemper & De Man, 1999; Van Beurden, in prep.) and a watch tower near De Meern (Van Haaster, 2004).

⁵ South of the Rhine delta: Nieuwerhoorn (Brinkkemper, 1993: 80-94), Houten-Tiellandt (Kooistra, 1996: 300-306), De Horden (Lange, 1990), Tiel-Passewaaij (Fokma, unpublished report of the Free University of Amsterdam), Tiel-Medel (Van Beurden, 2004), Kesteren (Kooistra & Van Haaster, 2001), Groesbeek (Van Beurden, unpublished report of the National Service for Archaeological Heritage in the Netherlands). North of the Rhine delta (Meffert, 1998: 81-84; Pals, 1987).

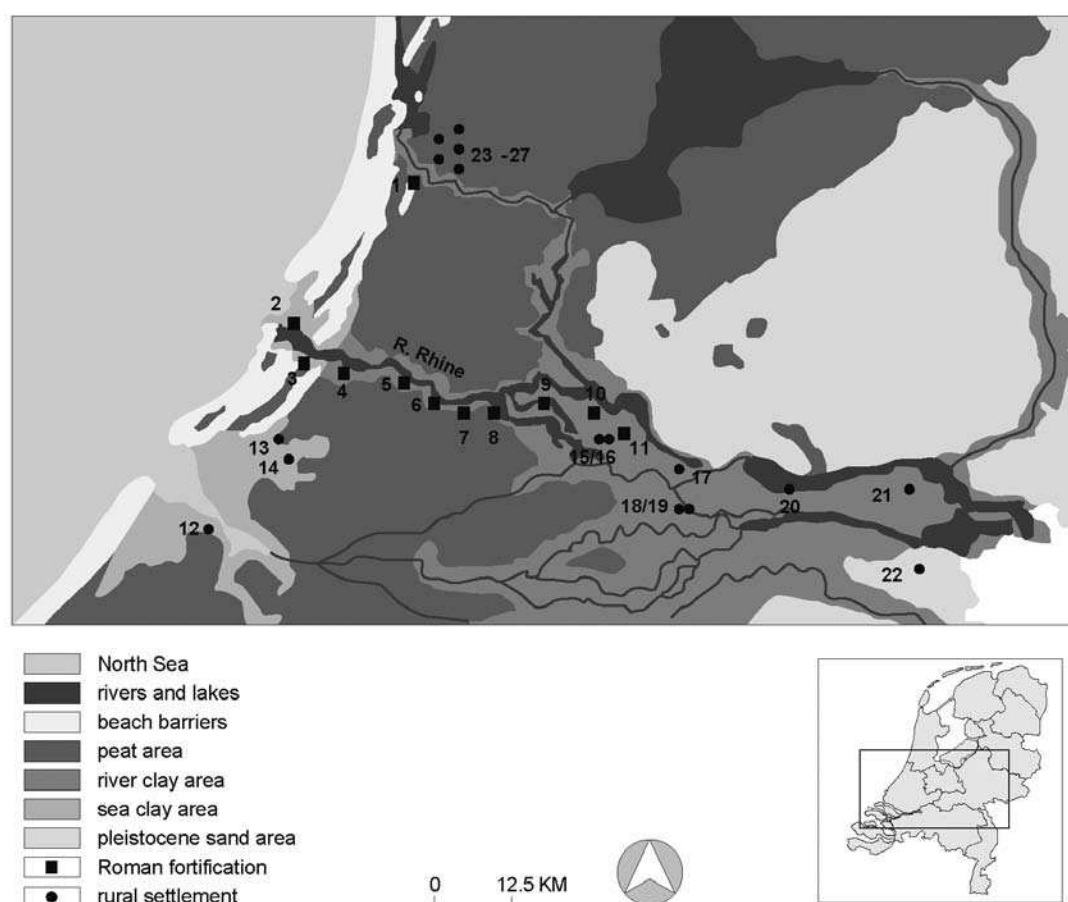


FIG. 1. Landscape of the study area, marked with the Roman fortifications and the rural settlements mentioned in this paper.

1) Velsen; 2) Brittenburg; 3) Valkenburg; 4) Roomburg; 5) Alphen a/d Rijn; 6) Zwammerdam; 7) Bodegraven; 8) Woerden; 9) De Meern; 10) Utrecht; 11) Vechten; 12) Nieuwerhoorn; 13) Harnaschpolder; 14) Vlaardingen; 15/16) Houten Tiellandt/Houten Doornkade; 17) De Horden; 18/19) Tiel Passewaaij/Tiel Medel; 20) Kesteren; 21) Arnhem Schuijtgraaf; 22) Groesbeek; 23-27) Assendelft sites C, D, F, H, K

Table 1 summarizes the different groups of plant foods found at military locations and in rural settlements.

In the first century before AD 70 we find inside the fortifications all cereals needed to prepare bread, including spelt wheat and bread wheat. Not all of these cereals were available from the rural settlements nearby. Hulled barley and emmer wheat were grown at all investigated rural settlements south of the river Rhine. On a smaller scale, also millet and oat were produced. Northwest of the river Rhine, hulled barley was the main crop. It is believed that the dominance of this crop is due to the rather brackish conditions in this area. Bread wheat and spelt wheat did not occur in any of the rural settlements, neither north nor south of the river Rhine. Also no vegetables, Mediterranean kitchen herbs and exotic food plants (for example fig, olive, walnut, grape) have been encountered in the local rural settlements. Yet these food products did occur at the military sites. This could be an indication that the rural population and the Roman army did not much engage in exchange of food products.

period	AD 40-70			AD 70-140		
	military	rural S of Rhine	rural N of Rhine	military	rural S of Rhine	rural N of Rhine
numbers of sites	4	7	3	4	8	2
Cereals						
Hulled barley	4	7	3	3	7	2
Millet	1	4	-	-	3	1
Oat	2	5	1	-	4	2
Rye	2	-	-	-	1	-
Bread wheat	2	-	-	2	(1)	-
Emmer wheat	4	7	-	4	5	2
Spelt wheat	3	-	-	4	(1)	-
Pulses						
Celtic bean	2	3	-	1	4	-
Vegetables and kitchen Herbs						
	3	1	-	3	5	-
Exotic food products						
	4	-	-	1	1	-

TABLE 1. Overview of cereals, pulses, vegetables and exotic food products found in military and rural settlements. Numbers in brackets mean that identification is uncertain

* It is not certain that the vegetable/kitchen herb mentioned here (celery) was part of the natural environment

The evidence available about the structure of rural settlements in the delta of the Rhine shows that these habitations consisted of quite small, mixed farms without substantial or structural surplus production (Meffert, 1998: 101-113; Kooistra, 1996: 50-55). Given the structure of these farms, it is most likely that local production of food was quite meagre and that therefore the only way for the Roman army to obtain spelt wheat and bread wheat in order to survive was to import the cereals required.

The main possibility for importing cereals is clearly by ship, either over sea and sailing up the river, or by navigating downstream on the rivers Rhine or Meuse. Historical evidence is provided by Tacitus⁶ who in AD 69 mentions that as a result of low water levels of the river Rhine, food could not be imported.

AD 70–140

The situation changed around the end of the first century, from which point it also is clear that the river Rhine had become the actual border of the Roman Empire.

Within three fortifications and at the *vicus* of Leiden Roomburg, the same range of cereals as for the first century have been found, although there is a growing preference for spelt wheat (see

⁶ *Hist.* IV, 26.

Table 1)⁷. Archaeobotanical evidence is available from eight rural settlements⁸ south of the river Rhine and two rural settlements northwest of the river⁹. The main crops on the farms situated immediately to the south of the Rhine are still hulled barley and emmer wheat. It seems that to some extent millet, oat and rye were produced. At the rural settlement at Kesteren-De Woerd, bread wheat and spelt wheat may have been present, but their identification is uncertain. This is why these species are in brackets in table 1. In this area, rural settlements also grew kitchen herbs and vegetables. Exotic products did occur, but were rare. In the two rural settlements northwest of the river Rhine, hulled barley continued to be the main crop, followed by oat, emmer wheat and millet. No kitchen herbs, vegetables or exotic food products have been found here.

It seems that the farms south of the border had undergone a change. They remained mixed farms, but grew bigger and arable farming became more important (Kooistra, 1996: 50-55). As a result of a population increase in the River Area, the possibilities of surplus production became minimal at a certain moment in the second century (Kooistra, 1996: 72-73). New research on the rural settlements at De Horden and Tiel Passewaaij aims to find out at what point the rural population grew too large to allow continued surplus cereal production (Groot *et alii*, 2006: *forthc.*). The situation north of the river Rhine remained unchanged with respect to the period AD 40–70. The rural settlements still were the same size and practised the same agrarian economy as during the previous period.

In the loess regions of the German Rhineland, southern Netherlands, Belgium, and northern France there was a surplus production of mainly spelt wheat (Kooistra, 1996: 102-104, 111-113 y 125-127).

In this period only hulled barley, spelt wheat, emmer wheat and bread wheat are found at military sites, including the *vicus* of Leiden Roomburg. There is an indication that the rural settlements south of the river Rhine attempted to produce a surplus of emmer wheat and hulled barley. It is possible that these crops of local origin did reach the military sites, but the increase in the rural population, which consumed the cereals at source, may have frustrated any surplus production for the Roman army. If this was the case, hulled barley and emmer wheat too were imported from elsewhere. It is certain that spelt wheat and bread wheat were imported to the military sites from the loess areas of Germania Inferior.

CONCLUDING REMARKS

The preliminary results of the investigation into the supply of cereals to the Roman army can be summarized as follows. During the period AD 40–70 the Roman fortifications were most probably supplied with cereals from outside the Rhine delta. During the period AD 70–140 the farmers south of the river Rhine strove for surplus production of hulled barley and emmer wheat.

⁷ Valkenburg (Van Zeist, 1968; Brinkkemper, unpublished), Leiden Roomburg the *vicus* (Kooistra, 2006a), Alphen aan de Rijn (Kooistra, 2004), Woerden (Van Beurden, 2006: *forthcoming*).

⁸ Harnaschpolder (Kooistra, 2006b), Vlaardingen (Brinkkemper & De Ridder, 2000), Houten Doornkade (Hogestijn, unpublished report of the University of Amsterdam), De Horden (Lange, 1990), Kesteren-De Woerd (Kooistra & Van Haaster, 2001), Tiel Passewaaij (Fokma, unpublished report of the Free University of Amsterdam), Arnhem Schuijftgraaf (Hänninen *et alii*, 2004), Groesbeek (Van Beurden, unpublished report of the National Service for Archaeological Heritage in the Netherlands).

⁹ Assendelft site F and K (Pals, 1987).

To what extent they succeeded is still uncertain. During the period AD 70–140, as in the preceding decades, spelt wheat and bread wheat were imported from more southerly regions.

The next steps in the study will be:

- to construct models in order to assess the agrarian potential of the landscape in relation to the size of the military and rural population;
- to integrate the results from the different fields and methods of investigation to fit together as much as possible of the puzzle of the provisioning of the Roman army.

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