

Food production and food procurement in the Bronze Age and Early Iron Age (2000-500 BC)

Hingh, A.E. de

Citation

Hingh, A. E. de. (2000, January 1). Food production and food procurement in the Bronze Age and Early Iron Age (2000-500 BC). Archaeological Studies Leiden University. Retrieved from https://hdl.handle.net/1887/13513

Version:	Corrected Publisher's Version
License:	<u>Licence agreement concerning inclusion of doctoral thesis in the Institutional</u> <u>Repository of the University of Leiden</u>
Downloaded from:	<u>https://hdl.handle.net/1887/13513</u>

Note: To cite this publication please use the final published version (if applicable).

contents

PART ONE: THE FRAMEWORK

1	Introduction to the research 13
1.1	Introduction 13
1.2	Defining the field of archaeobotany 14
	Introduction 14
	Definitions of environmental archaeology 14
1.3	The objectives and questions of research in the present study 15
	Research design 16
	Botanical data 16
	Framework 17
2	The archaeology of the Bronze Age and Iron Age society 19
2.1	Introduction 19
2.2	Bronze Age and Early Iron Age settlement organisation and burial customs 20
	The organisation and dynamics of settlements 20
	The Bronze Age and Iron Age farmhouse 24
	The introduction of the longhouse 24
	The organisation of the farmyard 28
	Burial customs in the Bronze Age and the Iron Age 29
2.3	Archaeological evidence of agriculture and agrarian land use 31
	Agricultural regimes 31
	Arable fields 32
	Dutch Celtic fields research 33
2.4	The agricultural land use system in relation to settlement dynamics 34
	Late Neolithic and Early and Middle Bronze Age 34
	Shifting and swidden cultivation 35
	Late Bronze Age and Early Iron Age 36
~ ~	Middle and Late Iron Age 37
2.5	Claims on arable land and land tenure, ownership of land 37
	Bronze Age barrows 37
	Late Bronze Age and Early Iron Age 38
	Intensification of agriculture = property of land? 38
	Middle and Late Iron Age 38
	Settlements, burials and the frequency of cropping 39
	Do claims on land or access to land imply an ownership of land in prehistory? 40
•	Working model 40
2.6	State of affairs 41
3	Models of the intensification of agriculture 43
3 1	Introduction 13

3.1 Introduction 433.2 Extensive and intensive agriculture 43

		Evidence of agricultural intensification in archaeobotany 44 Demonstrating extensive cultivation in archaeobotany 44	
3.3	Boserup	45	
	Ĩ	Population pressure 45	
		Land use aspects in Boserup's model of agricultural intensification 46	
		Technological aspects 47	
		Labour input 47	
		Operationalising the frequency of cropping-model in archaeology and in archaeobotany	48
3.4	Morrison	49	
		Morrison on Boserup 49	
		Morrison beyond Boserup 50	
		Operationalising the Morrison model 50	
3.5	Final remain	arks 51	

PART TWO: THE BOTANICAL RESEARCH

4	The botanical material under study: introduction to the methods 55
4.1	Introduction 55
4.2	The nature of the investigated locations and the adopted sampling strategies 55
4.3	The archaeological contexts 58
4.4	Dating of the samples 58
	Dating and grouping of the samples from the Moselle region 58
	Dating and grouping of the samples from the MDS region 59
4.5	The preservation of the plant material 59
4.6	Co-operation with partners 59
	The regional archaeological service of Lorraine 59
	Policy: prospection and excavation 59
	Sampling strategy 60
	Selection of locations and samples for this study 60
4.7	A selection of other locations in the study region 60
5	The material under study: Lorraine region, France 65
5.1	Aéroport Régional de Lorraine - Liéhon, Louvigny, Goin, Vigny (57) 65
5.2	Ars-sur-Moselle (57) 71
5.3	Ay-sur-Moselle (57) 72
5.4	Basse Ham (57) 73
5.5	Betting (57) 74
5.6	Crévéchamps "Tronc du Chêne" (54) 75
5.7	Ennery "Kléber" (57) 87
5.8	Ennery "Solotra" (57) 87
5.9	Frouard "Haut de Penotte" (54) 88
5.10	Frouard "Z.A.C. du Saule Gaillard" (54) 94
5.11	Gandrange (57) 94
5.12	Gavisse (57) 97
5.13	Gondreville "site 4" (54) 97
5.14	Jouy-aux-Arches "La Machotte" (57) 100
5.15	Marly "Le Clos des Sorbiers" (57) 102
5.16	Rettel "Chemin de Sierck" (57) 103
5.17	Trémery/Flévy "Massey Fergusson" 1995 (57) 106
5.18	Ennery/Flévy/Trémery "Voirie"- Site 4 (57) 107
5.19	Woippy (57) 111
5.20	Yutz "Tracé du Contournement sud-est", sites 13, 15 and 17 (57) 111

6	The botanical	material	under study:	Luxemburg	117

- 6.1 Rémerschen Schengerwis 117
- 6.2 Budersberg Dudelange 120
- 6.3 Peppange Keitzenberg 121
- 7 The botanical material under study: the MDS region 123
- 7.1 Geldrop 123

8 The general results of the botanical analyses 129

- 8.1 Moselle region 129
- 8.1.1 Chronology and grouping of the samples 129
- 8.1.2 The crops 130
- 8.1.3 The arable weeds 135
- 8.1.4 The fruits and nuts collected from the wild 135
- 8.1.5 Summary of the results of the botanical analyses of the Moselle material 136
- 8.2 The site of Geldrop and the MDS region 136
- 8.2.1 Chronology and grouping of the samples 137
- 8.2.2 The crops 137
- 8.2.3 The arable weeds 139
- 8.2.4 The fruits and nuts collected from the wild 139
- 8.2.5 Summary of the results of the botanical analyses of the MDS material 141

PART THREE: THE ANALYSIS

9	The arable weeds: the nature of arable fields and the appropriation of land 145	
9.1	Introduction 145	
	Methodological programme 145	
9.2	The first analysis of the arable weeds 146	
	All locations studied are producer and consumer sites, and no import of crops took place 146	
	We only find final stages of crop processing in the assemblages under study 146	
	All weeds from the investigated samples are arable weeds 147	
9.3	Different approaches of the interpretation of weeds 149	
	The phytosociological approach 149	
	The study of individual plant species 150	
	The ecotope system 150	
9.4	The use of the ecotope system in the present study 150	
	Characteristics and classes to define ecological groups 151	
9.5	More ecological and anthropogenic information on arable weed species 151	
	Harvest height 156	
	Extensive and intensive agriculture, fallow periods and frequency of cropping 156	
	Absolute number of weed seeds and weed species 157	
	Ploughing 157	
	Size of the fields 158	
9.6	More on nutrient availability, soil fertility and the use of manure 158	
	Manure 158	
	Papilionaceae 158	
	Heavy manuring 158	
	No manuring 159	
	Archaeological and historical evidence of the use of manure in agriculture 159	
9.7	Moselle region 160	
9.8	The site of Geldrop and the MDS region 167	
9.9	Conclusion 174	

10	The crops in Bronze Age and Early Iron Age: diversification? 177
10.1	Introduction 177
10.2	The range of crops 177
	Range of crops in the Moselle region 178
	Range of crops in the MDS region 179
10.3	The individual crops 179
	Naked and hulled barley 179
	Wheats 185
	Emmer wheat 186
	Einkorn 186
	Spelt wheat 186
	Bread wheat 187
	Rye 187
	Oats 187
	Millet 188
	Pulses 188
	Horse bean 189
	Pea 189
	Lentil 189
	Gold of pleasure and flax 190
10.4	Mixed crop assemblages 190
	Identification of maslins 190
	Mixed cropping 191
	Crop rotation, multi-course-cultivation or multiple cropping? 191
	Indications in the study material 192
10.5	Conclusion 192
	Diversity in the range of crop species 195
	Rise of spelt? 196
11	The collection of wild plants: risk reduction? 197
11.1	Introduction 197
11.2	The evidence on gathering in this study 197
11.3	The role of acorns: balanophagy 200
11.4	Conclusion 202
11.7	
12	The agrarian production and food procurement systems in Bronze Age and Early Iron Age in the study area 203
10.1	Introduction 203
12.1 12.2	
	Botanical evidence 203
12.3	Agricultural change 204 Intensification 204
	Risk reduction 205
1221	
12.3.1	The use of manure 206
12.3.2	Fallow 207 Noticity of around 207
12.3.3 12.4	Variety of crops 207
12.4	The results in their archaeological context 208
	The appropriation of land in the Middle Bronze Age 209 The longhouse Hauslandschaft: contrast or no contrast between the sub regions? 200
12.4.2 12.4.3	The longhouse- <i>Hauslandschaft</i> : contrast or no contrast between the sub-regions? 209 Celtic fields agriculture 210
12.4.5	Appropriation of land in the Early Iron Age 211
12.4.4	Soil fertility and ritual practices in the Hallstatt-La Tène transitional period 212
12. + .J	son returny and mual practices in the manstan-La rene transmonal period 212

Notes 213

References 215

Samenvatting (Dutch summary) 225

Acknowledgements 233

Curriculum vitae 235