UNIVERSITY OF CAMBRIDGE

What can archaeobotany tell us about lost and underutilised crops?

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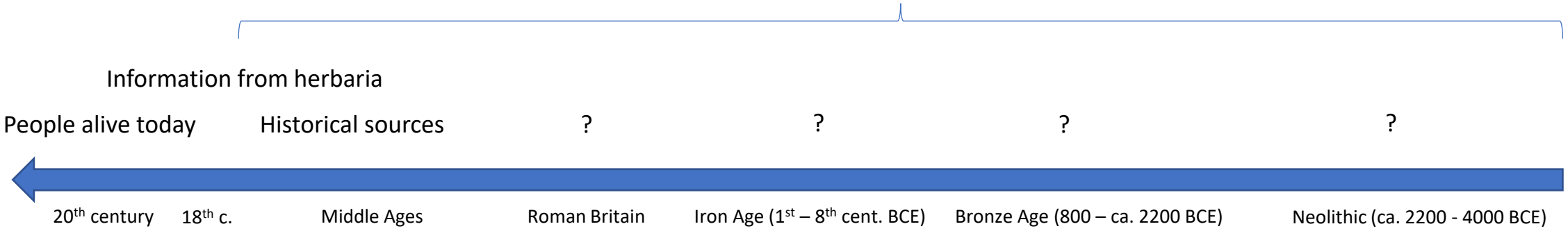
What is Archaeobotany and how can we learn about past agriculture and plant use?

Archaeobotany investigates past plant use and agriculture

- Agricultural origins and plant domestication
- Development of agricultural systems
- Plants as foods, medicine, and raw materials
- Plants in rituals and religion

Charcoal and charred olive stones from Carchemish on the Euphrates in modern Türkiye/Syria

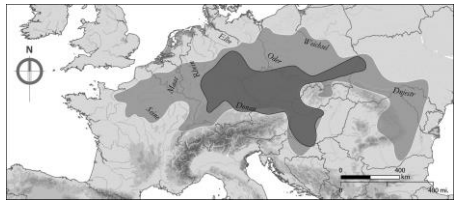
Archaeobotany provides a unique deep-time perspective on agriculture and crop diversity



Example 1: *Chenopodium* spp. in Europe and the Americas

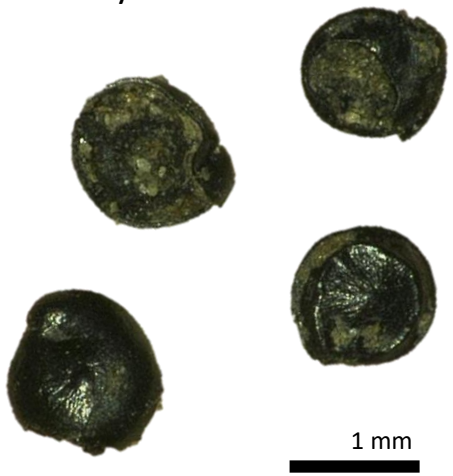
***Chenopodium* species around the world were cultivated and in parts domesticated, and disappeared in prehistory**

- eastern North America: *Chenopodium berlandieri* subsp. *jonesianum*
- Europe: *Chenopodium album* (although domestication status is unclear)
- Most common modern domesticate is *Chenopodium quinoa* (Andes)



Typical longhouse of the Linear Pottery Culture (LBK): the first farmers of Europe (5500–4900 BCE)

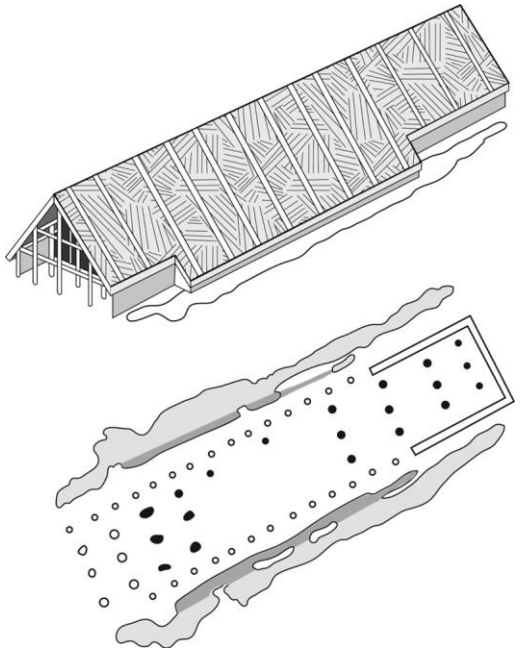
Charred seeds from a *C. album* concentration found in a Middle Neolithic (4th millennium BCE) settlement at Lake Constance, Germany



Weide et al. in review

High concentrations of charred seeds of *C. album* from all over Europe (here an LBK settlement in central Poland) indicate storage and processing: **a lost crop?**

Mueller-Bieniek et al. 2019



Shennan 2018, based on Lüning 1988

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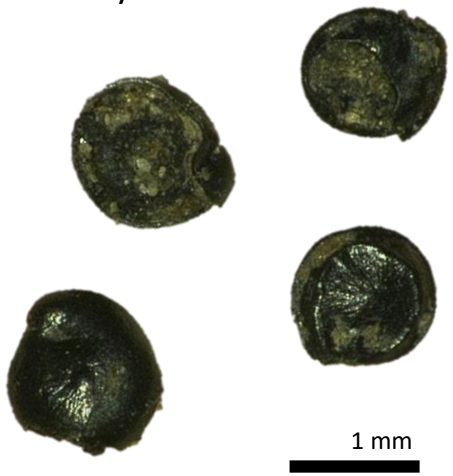

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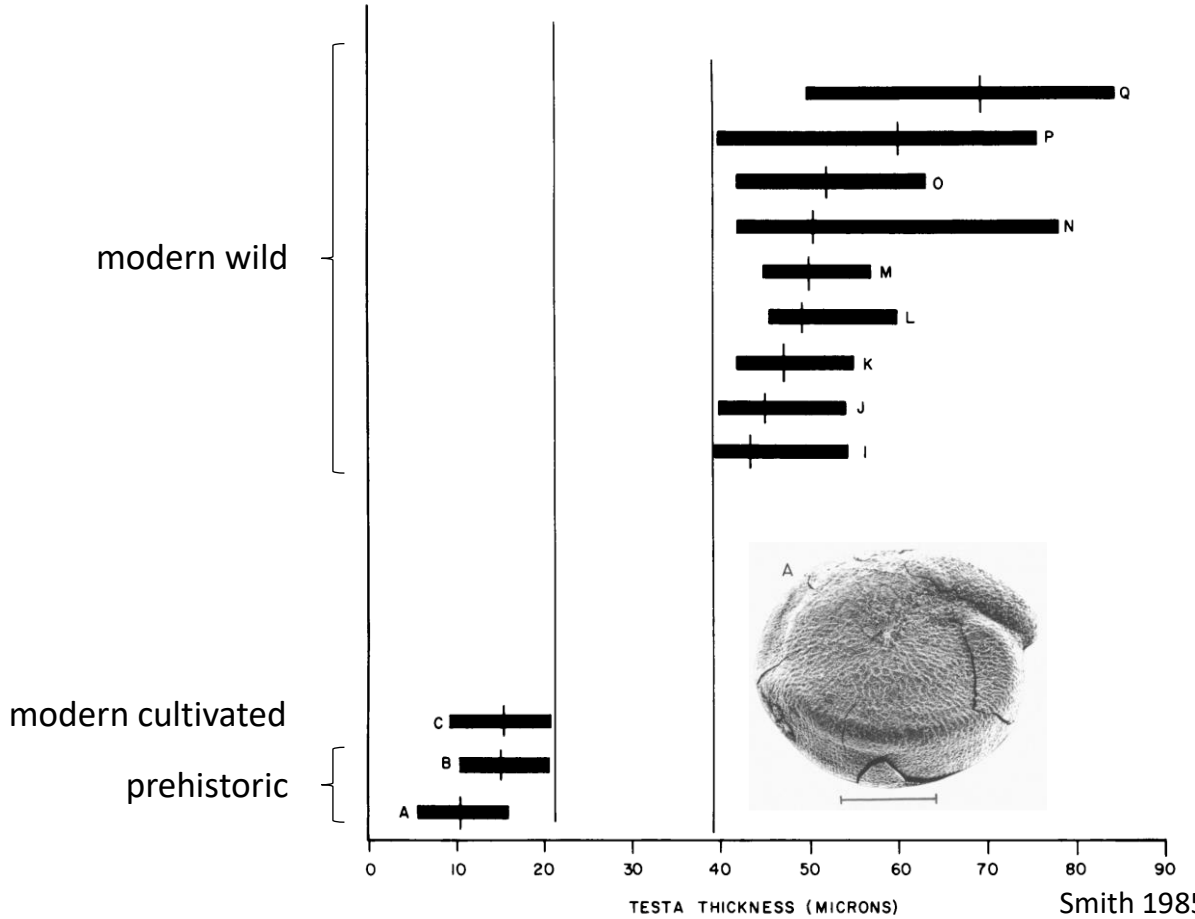
Reduced testa thickness of prehistoric *Chenopodium berlandieri* subsp. *jonesianum* seeds from caves in eastern North America indicates reduced dormancy: **domesticated around 1500 BCE**



Smith 1985

Example 2: a prehistoric cultivar related to *Triticum timopheevii* (timopheev's wheat)

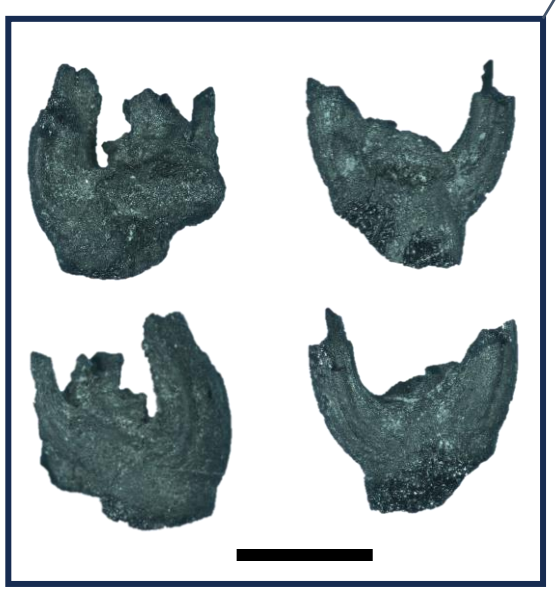
First described as a mysterious "new glume wheat" by Glynis Jones et al. in 2000, genetic evidence reveals that the cereal belongs to *T. timopheevii*

This prehistoric *timopheevii* cultivar was widespread across Europe and west Asia since the Neolithic, and disappeared during the late Iron Age (late 1st millennium BCE)

Filipovic et al. 2023

Filipovic et al. 2023

Jones et al. 2000



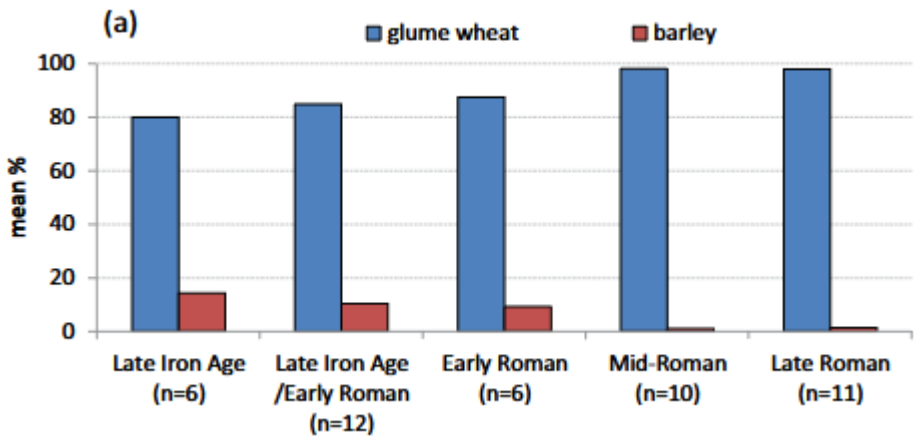
"New glume wheat" aka T. *timopheevii s.l.* from early Neolithic Halula, Syria (ca. early 8th mill. BCE)

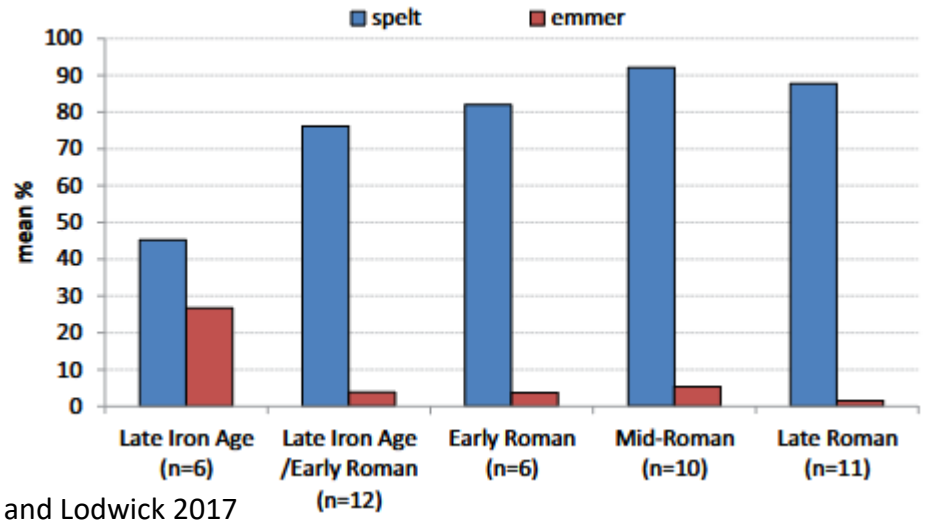
Weide and Buxo, in prep.

Example 3: (pre)historic cereal diversity in Britain

Many cereal species were grown on large scales in Britain's past, incl. emmer wheat, spelt and rye

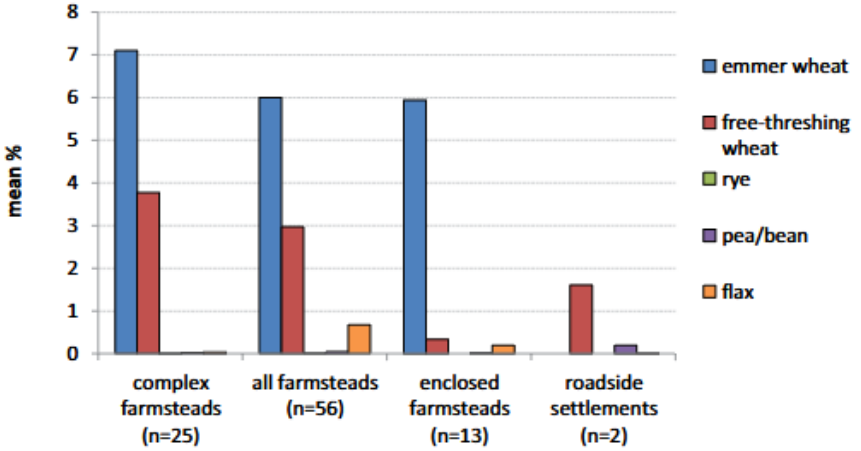
The Roman period in West Anglia, and southern England more widely, was dominated by a heavy focus on spelt cultivation



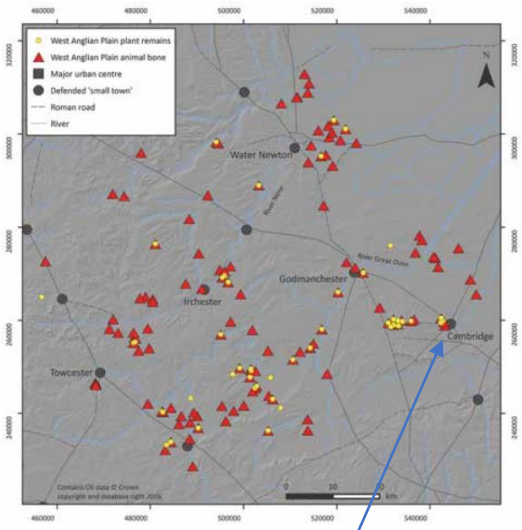


Allen and Lodwick 2017

Emmer, naked wheats, rye, legumes and flax were minor crops grown alongside spelt



Triticum spelta



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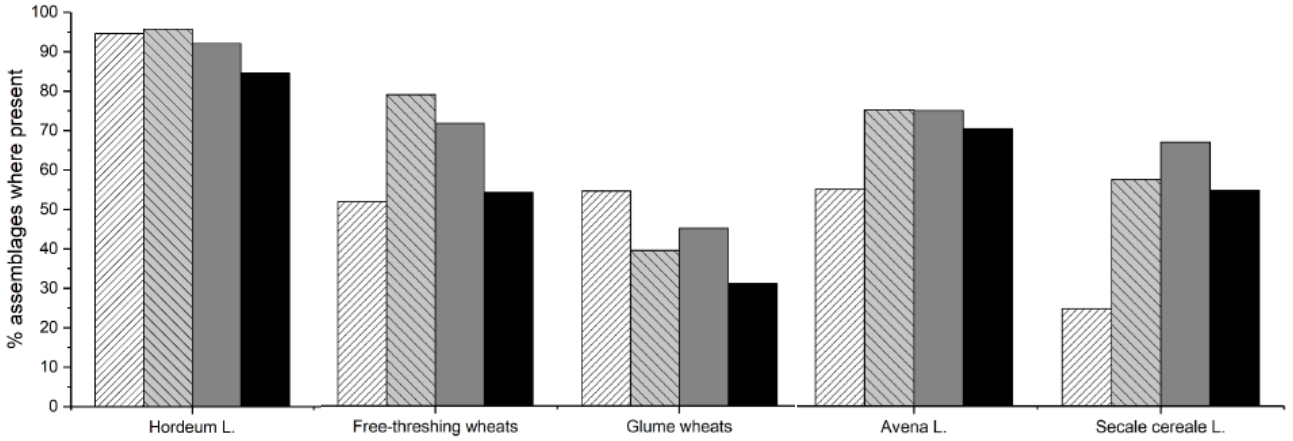
The early-mid Ango-Saxon period (450–850 AD) saw a focus on oat and rye cultivation

reconstructed helmet from the Sutton Hoo ship burial



barley

naked wheats emmer/spelt

oat

rye

What can we do with that knowledge when it comes to modern crop diversity?

- Archaeobotany provides a **unique record of crops grown in the past, including those long gone or today underutilised**
- Archaeobotany can show that **species were grown in a certain area in the past and are suited to be grown in that area again**
- The biggest question is **how to understand these crops as an opportunity** and to **encourage farmers to grow them again**
- What are the main **challenges to increase crop diversity today?**