Traditional reconstruction of arable weed communities from archaeological assemblages, using the present day ecological groups and phytosociology indicators has been widely discussed and questioned (Küster 1991; Hillman 1991; Brehm and Jacomet 1991; Jones 1992). As an alternative method, the FIBS (Functional Interpretation of Weed Flora) in relation to Husbandry Practices has been developed (Charles et al. 1997; Jones et al. 2010). This approach is supported by the rationale that husbandry practises modify the arable habitat in different ways and therefore promote the species that possess a high potential of adaptability or specific characteristics in response to the new ecological conditions developed. In this presentation, we applied selected functional attributes from the FIBS (Bogaard 2004; Jones et al. 2005) to a long-term approach based on a Northern France archaeological dataset (regions of North (Pas de Calais, Picardy, Champagne-Ardenne, Normandy), including about 220 settlements dated from the early Neolithic up to the beginning of the medieval period (Bakels 1984; 1996; De Hingh 2000; Dietsch 2000; Matteau 2001 and unpublished data from Bonnaire, Derreuxaux, Matteau, Pais, Toulousemonde, Wethold).

The aims of this study were to identify the characteristics of the species which could disappear, but also be introduced in relation to the main switch observed in crop husbandry practices and crop balance, like the cultivation of pulses at a large scale and the promotion of naked cereals (wheat and rye) in the beginning of the Gallo-Roman period (Zech-Matterne et al. 2009).

The work focuses on arable weeds, including present-day species actually considered as ruderals or pasture adventives, which could be part of the cultivated fields flora in ancient time. In order to avoid the problems inferred by the removal of selected weeds during crop processing (Jones 1992; Bogaard et al. 2005), only domestic refuse: waterlogged fillings from wells and latrines and long-term charred accumulations (pit refuse) have been taken into account.

### The transformation of agricultural systems

The evolutions observable within the composition of arable-weed floras accompany several transformations of plant husbandry regimes, as shown by archaeobotanical studies, such as:

- The fluctuations of the importance of the millets in agricultural systems (above)
- The balance between maslins and monocrops (centre)
- The introduction of pulses in arable fields rotations (from the LT C in Calvados region and from Gallo-Roman period elsewhere in northern France) (right)
- The most important shifting, from garden cultivation and spring-sowing crop to the extensive cultivation of fields and pastures is probably due to the generalisation of the iron tools, especially for tillage, and the possibility to exploit any kind of soils (around the 1st c. BC in northern France)

### Canonical Correspondence Analysis on 88 taxa, 216 sites, 16 periods and 16 attributes: carbonised assemblages only

The figure shows a very similar distribution than previously for waterlogged assemblages:

- Spring-sown annuals and late flowering species, associated with intensive cultivation regimes, plotted together with the early protohistoric periods until LT C (with the exception of LT A)
- Autumn-sown annuals and extensive cultivation regimes associated with the Late Neolithic and Bronze Age periods
- The possibility of cultivated fallows suggested by the long-flowering species and perennial able to regenerate from repetitive ploughing
- Interestingly the association of Late Empire and Merovingian sites together with waste lands. We interpret this potentially as the concentration of arable fields around the settlements still densely occupied. The question of the “agr desert” has been discussed by several authors (Ouzoulias, 1997)