Archeobotanica uit ’s-Hertogenbosch. Milieuomstandigheden, bewoningsgeschiedenis en economische ontwikkelingen in en rond een (post)middeleeuwse stad

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7. **Summary**

The archaeobotanical research in the old inner city has provided interesting information on the urban structure, diet and agricultural developments. In the town one sees clearly a development from widely spaced housing to a compact urban built up. Archaeobotanical research showed in the first phase the presence of kitchen gardens within the town walls. Cattle were also kept in the urban area. Analysis of animal dung found in large pits in the town, showed the presence of hayfields that were not used for actual grazing, in the close surroundings of the town. There are clear indications that cattle were kept and fed in stables inside the town. In the last quarter of the 13th century the consumption of garden crops increased sharply. This coincides with a period of strong urban growth. In the past the rise of horticulture and in general the intensification of farming (indicated by the abandonment of fallow systems and the change to the cultivation of industrial crops has been related to the crisis in the agriculture, which started around 1400 with a period of low prices of cereals. For economic reasons farmers would have changed over to the cultivation of crops that were more labour intensive. This theory was mainly based on historical data, which are, however, only available in reasonable numbers from the 14th century onwards. Archaeobotanical data and historical data that became recently available, from earlier periods, show that the intensification of farming expanded strongly over a wide geographical area from the 14th century onward, but they show also that this process started, especially in the Southern Netherlands, at a much earlier date. The intensification of agriculture is clearly related to the strong growth of towns and the beginning of a market economy, a process which started early in the Southern Netherlands.

No decisive answer could be found to the question where the market garden products which were consumed in , were grown. From the 14th century there was probably not enough space anymore within the town walls, due to the density of the housing. From that period on horticulture in most towns took place in a zone just outside the walls. The hydrological situation around 's-Hertogenbosch did not, however, allow for horticulture outside the town walls. Probably many market garden products were brought in from the neighbouring areas. A number of products came definitely from international trade: rice, pepper, pomegranate, figs, dates, paradise grain, cloves. A tentative archive study showed the imports of lime, nutmeg, mace of nutmeg, cinnamon, saffron and sugar. These products were mainly bought on the markets of Bruges and Antwerp.

As staple food, rye was by far the most important. From the 14th century onwards the share of buckwheat increases substantially. The analysis of the seeds that were harvested with the rye, showed that the rye was grown as a continuous monoculture on poor sandy soils. Also evidence was found that from the second half of the 13th century the arable fields were manured with animal dung. As poor sandy soils are present in the Meierij, and the indicators of sandy soils from totally different climatic regions are lacking in the weeds, we assume that the rye was cultivated in the Meierij. In the beginning of the 16th century 's-Hertogenbosch, with an estimated 22,000 inhabitants, was the largest town in Brabant after Antwerp and Brussels. The amount of bread wheat needed on a yearly basis at the time, is estimated to be 6000 tons. At first sight the conclusion that this amount of wheat could be grown in the Meierij, seems risky.

Calculations on cereal yields show that sandy soils with a good manuring system can produce 1000 – 1400 kilograms of wheat per hectare. Historical-geographical studies have shown that the required 6000 to 9000 hectares of farm land were available in the Meierij during the Late Middle Ages.

The study of the socio-economic differentiation in the town, and especially the way in which this differentiation manifested itself on the level of diet, has also provided interesting results. It has shown that finds of exotic, imported food products correlate very
well with contexts in which rich archaeological finds were made. Food products that are
strongly related to contexts with high status are rice, pepper, pomegranate, dates, yellow
dogberries, gherkins/cucumber, capers and pumpkin. These food products were obviously
not consumed by the poor or common people. In 's-Hertogenbosch this does not count for
paradise grain and cloves. Both spices are found in rich as well as in poorer
neighbourhoods, certainly in the 16th century. This corresponds well with the historical
data on the paradise grain. Apparently the price of cloves was also relatively low in the
16th century, as its use was not limited to the elite.

The research showed on the other hand no indications that certain 'common' food
products were avoided by the elite. However, we must emphasize that at this moment we
cannot demonstrate in archaeobotanical analysis the consumption of the real 'peasant'
food products such as parsnip, turnip, garlic, leeks and onions. The presence of
buckwheat and millet can be shown, but although both products are not known for their
high quality, they were obviously eaten by the rich inhabitants of the town.

The palynological research has provided important information on the settlement history
and the agricultural developments in the hinterland of 's-Hertogenbosch. The conclusion
that the area was already occupied in the Iron Age, is not surprising in view of the results
of archaeological investigations in the area. In the Roman period there is an increase in
anthropogenic influences in the pollen diagrams, after the Roman Period there is clearly a
decrease. The woods were regenerating, possibly as a consequence of the abandonment of
the farming fields. In Merovingian times the human influence increased again in the area.

A sharp rise in the percentage of heather, cultivated crops and weeds from cultivated
fields in the pollen diagrams suggests an important phase of renewed cultivation of the
land in the Carolingian Period. In the late Middle Ages the percentages of indicators of
cultivation increase explosively. There are indications that a number of agricultural
developments took place almost simultaneously. Apart from the rapid expansion of the
heather fields, which probably should be interpreted as the emergence of sheep farming in
connection with sod cutting in the region, there are also indications that the continuous
cultivation of rye together with a farmyard manuring system, became important.

Hayfields and the cultivation of buckwheat were also expanding during the Late Middle
Ages. Historical and cultural-archaeological studies have shown that in Midden-Brabant
during the Late Middle Ages important sociological changes have taken place. The results
of the archaeobotanical research that now have become available, have greatly improved
our understanding of those changes.