

RESEARCH ARTICLE

Two hundred barrels of manure: Fertilisation, environmental stewardship, and short-term leasehold in Cambrésis, 1330–1400

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Abstract

From its spread in the thirteenth century onwards, short-term leasehold became one of the most common and powerful institutions of land management in Western Europe. Its rise is often strongly connected to the commercialisation of agriculture and short-term profit-seeking, with overexploitation of the soil as a consequence. However, when looking closely at short-term lease contracts of the fourteenth century, these extensive documents often contain a multitude of clauses on the upkeep of the soil, water management, and care for the present fauna and flora. This paper aims to investigate how the management of the soil was regulated through a leasehold in Cambrésis, currently in the north of France, through an in-depth study of the clauses on fertilisation by manure and care for the soil, as recorded in two rather unique fourteenth-century lease ledgers. What can these contracts reveal about contemporary agricultural practices, such as fertilisation? How did the administrators of the Saint-Julien hospital and the collegial chapter of Saint-Géry in Cambrai safeguard the long-term health and value of their leased-out properties in a period of severe crises and rising commercial pressure? Through this research, this paper proposes that short-term leasehold could, in certain conditions, stimulate forms of environmental stewardship.

In 1383, Colars le Flamand leased a plot of land with a house for nine years from the collegial chapter of Saint-Géry in Cambrai. The lease contract stipulated that he was to apply a total of 200 barrels of manure (*II^c barillies de fiens*) on the field.¹ When dealing with lease contracts, often considered highly standardised legal documents, historians are plagued with uncertainty: did Colars fulfil these conditions? Fortunately, the canons of Saint-Géry didn't leave things up to faith. The same ledger containing the contract also contains several follow-up notes for every year of the lease, remarking whether Colars had applied enough manure and who had served as witnesses to the fact.² Although his follow-through was a bit unbalanced – overabundance in some years, a bit lacking in others – the collegial chapter was apparently pleased, as Colars' lease was renewed again already in 1390 for nine years.³ Although the new contract didn't mention any specific clauses on fertilisation, a new flurry of additional notes reveals that he did continue to apply manure and that it was still checked rigorously.⁴ Colars would lease the same land until his death – after which his children Jehan, Hanotius, Nassete, and Maignon took over.⁵

'*Wo Mistus da Christus*' (where manure, there Christ), a popular German saying goes, indicating the crucial importance of fertiliser to organic farming. Although there is some debate on fertilisation by manure in preindustrial Europe – though not nearly of the magnitude of the debates on current fertilisation – most historians agree on two facts: maintaining soil fertility was

an everlasting and important challenge, and there was a structural shortage of manure. Before the import of guano, or later the production of artificial fertilisers, the agricultural sector was dependent on natural fertilisers, such as straw, and manure, produced by animals and men. However, neither the medieval livestock nor the human populations were sufficiently high to produce enough of the matter necessary to cover all the arable lands. This, combined with high transport costs and the imperfect collection systems for the so-called nightsoil in the cities, made manure an expensive commodity. Especially the marginal, less fertile lands, which were exploited increasingly from the High Middle Ages onwards due to the increasing population pressure, faced a chronic shortage.⁶

Although there are a few studies on fertilisation and the upkeep of soil health in the late Middle Ages, the actual practices were often not documented nor are there many medieval tracts or other guidelines found on these subjects in continental Western Europe. Of course, manuring is documented in demesne farming, and the manorial accounts record the (labour) inputs in the fertilisation of the fields, but demesne farming is a highly specific form of agricultural organisation and not necessarily representative of agriculture as a whole.⁷ Moreover, outside England, demesne farming is limited from the thirteenth century onwards. For the later Middle Ages, there is one alternative source that does inform us on both practices and expectations related to fertilisation: lease contracts. Leasehold was relatively new in thirteenth-century Europe, resulting from the conversion of both demesne lands and customary tenancies into competitive short-term leaseholds.⁸ Whilst it is mostly associated with a very competitive and highly extractive type of land management, this article investigates whether short-term leasehold could potentially play an important role in the ‘good’ management of natural resources – stimulate a form of environmental stewardship so to speak.

For two institutes in the prince-bishopric Cambrésis, nowadays in the north of France, the *hôpital Saint-Julien* and the *chapître Saint-Géry*, a rather exceptional collection of fourteenth-century leases has been preserved. In this article, we aim to investigate what these contracts reveal about the agricultural practices in this region, especially concerning fertilisation. Which role did short-term leasehold play in the management of the soil health here? Is there an aspect of environmental stewardship present in these contracts? And how did this all evolve throughout the turbulent fourteenth century?

First, the region will shortly be introduced. Next, a more thorough reflection will follow on leasehold and its connection to environmental stewardship, and the sources. Afterwards, the leases will be analysed in more detail, looking mostly at fertilisation by manure: the general trends, the role of location and size of the lands, and the evolution through time. Lastly, other elements dealing with soil health in the lease contracts will be discussed.

Cambrésis, with Cambrai as its capital, was located between France and the principalities of the Low Countries (Map 1). Although officially a semi-independent prince-bishopric of the Holy Roman Empire, it was often dependent on or under the protectorate of the king of France or the Count of Flanders (and later the Dukes of Burgundy). The small state was home to several large and wealthy ecclesiastic institutions, which practically owned the majority of land within Cambrésis and many lands outside the state as well.⁹ Furthermore, the land was characterised by relatively fertile silty soils, with especially in the north of the prince-bishopric a large presence of alluvial soils, though less so in the more mountainous region in the south, the so-called *Haut-Cambrésis*. Cambrai and the nearby northern cities of Lille and Douai grew to be the paramount ‘grain-exporting’ cities to the wider region of the Low Countries and the north of France in the late Middle Ages, with especially the densely populated cities of northern Flanders quite dependent on the grain coming from this region.¹⁰

The hospital of Saint-Julien was not the only hospital in Cambrai, but it was a significant one, as it was not only one of the first urban hospitals in the city (founded in 1071) but also because it was broadly accessible to both citizens as well as the poor, travellers, migrants, and the like.¹¹ Due to its central function, its land management strategy was predominantly focused on acquiring



Map 1. The Southern Low Countries and the north of France at the end of the Middle Ages, with Cambrésis emphasised. *Note:* This map presents the situation at the end of the fifteenth century. There is no information on its exact borders in the fourteenth century, but most likely – aside from the northern border – these were quite similar. Map by Arnoud Jensen, Iason Jongepier, and Léa Hermenault.

provisioning and the funds for upkeep. Nonetheless, the hospital too actively participated in the grain market but more as part of their general income strategy rather than prompted by profit-seeking. The collegiate chapter of Saint-Géry, the second most important chapter next to the cathedral, did not have many mouths to feed, as the canons received prebends to provide for themselves – although granted, these could partially be paid in grain as well. Aside from insignificant amounts of grain for their canons and some for charity, most of the grain they accumulated through their lease lands was to be sold at the market. In general, the chapter could be perceived as more profit-oriented.¹²

Due to the destruction of the city archives during World War I, researchers are reliant on the remaining sources of the institutions to reconstruct the rich past of Cambrésis, with pre-Black Death sources being especially scarce. Consequently, much of its medieval socio-economic history remains unknown, especially concerning the surrounding hinterland.¹³ From the remaining sources, it is known that the countryside was characterised by a low demography and a domination of large farmsteads. Research into the broader area has also revealed an early adoption of the three-field system, with typically a rotation of wheat, oats, and fallow (or vetches and

legumes), and the persistence of open fields and the organisation of the rural landscape into an infield and outfield system.¹⁴ Furthermore, Thoen and Leturcq both found signs of *Flurzwang* being present in some communities in the broader region. This meant that the community (or local lord) set the agricultural rhythm, enforcing strict control over the agricultural activities within their borders – ‘a topographical (three-tier) crop rotation’ as Thoen called it.¹⁵

Upgrading management, downgrading nature?

In the fourteenth century, short-term leasehold was still relatively new. From the thirteenth century onwards, it spread across Western Europe and beyond, quickly becoming the dominant tool of land management. Although its exact origin remains somewhat shrouded in mystery, it is often positioned as a response to the rising population pressure during the period of growth at the height of the High Middle Ages, resulting in a lack of available fertile lands – all often already given out in customary rents. Consequently, there was pressure on the farmers to up productivity and the increasing transformation of less ideal lands into arable land – both elevating the risk of overexploitation of the soil. Furthermore, inflation hollowed out the customary rents, resulting in losses of profit. Short-term leasehold allowed landlords more flexibility, especially in price setting, and was supposedly first used to exploit the ‘marginal’ lands that were brought under cultivation.¹⁶ Additionally, within historiography, it is frequently linked to the commercialisation of agriculture, short-term profit-seeking and the eventual rise of agrarian capitalism. The dominant narrative here asserts that short-term leasehold is primarily aimed at generating profit, with little to no regard for the natural resources, leading to overexploitation of said resources – including the soil.¹⁷

A key element in this theoretical framework is the rise of a competitive lease market. The struggle for lease lands would only further overexploitation, as the lessees, or their competitors, would try to gain the right to (renew) the lease by tempting the lessor with higher profits. This could be done by trying to produce higher yields to give to the lessor or to sell in the case of cash payments. According to Brenner, this pursuit of higher productivity would stimulate investment. However, according to Kerridge, the fact that the lessees do not own the land and the uncertainty of renewal would contribute to disinvestment by the lessees, who would opt to try to get the most out of the land in the time they have it and not be prone to make long-term investments, resulting in exhaustion of the soils’ nutrients.¹⁸ This link between short-term leasehold and disinvestment in the long-term health of the soil is noted even in current times.¹⁹

Turner et al. hypothesise that short-term lease contracts could, however, also be used to reinforce good, responsible long-term management of natural resources, in other words: function as a form of environmental stewardship. Whilst talking about sustainable agricultural practices within open-field farming, they address the known pitfalls of individual agency within communal undertakings, stating that ‘*good husbandry must not always be assumed, it might have been enforced – through lease covenants for example*’.²⁰ However, the authors too argue that such practices come under pressure, or even disappear, in times of crisis or due to increased commercialisation and only apply their theory to open-field farming.²¹ This connection between short-term leasehold and environmental stewardship, however, is not farfetched, as the concept of environmental stewardship derives from two ‘historical’ concepts: biblical stewardship and medieval stewardship, the system of delegated demesne management in the High Middle Ages.

Regarding the former, albeit less important here, theological-historical studies have also shown that the biblical concept of stewardship was not just known but also actively circulated in the late Middle Ages.²² The impact hereof on medieval land management, however, requires more investigation. Concerning the latter, Fourquin and Delmaire both remarked how short-term leasehold evolved from this existing practice of stewardship.²³ Additionally, Stone showed how the earliest leaseholders were often recruited from the former stewards.²⁴ Furthermore, in previous studies on leasehold, authors such as Janssen and van der Meulen have remarked on the persistent

and conscious presence of clauses to do with the care for natural resources and the (implicit) emphasis on ‘due diligence’ in lease contracts.²⁵ All these elements point to lease contracts as an interesting source to investigate agricultural practices and the management of soil health.

By their nature, lease contracts are, of course, legal documents that are prone to formalisation and standardisation, relying on regional custom stipulating the respective duties of landlord and tenant. Derville too remarks, based on the accounts of Saint-Julien, that many of the actual payments by their lessees were either belated or lower than stipulated in the contracts.²⁶ To study agricultural practices, Lindemans too used lease contracts but has received criticism about relying on these sources.²⁷ However, as Brunel remarks, early short-term lease contracts often lacked standardisation, and because of their novelty, lessors included as many aspects of real agricultural practices as possible.²⁸

Although it is difficult to gain insight into the pre-1348 situation, both institutions do seem to show signs of still ‘transitioning’ to short-term leasehold. In the case of Saint-Géry, from 1370 onwards, the lands of Contehem – previously held in customary rent – were leased out.²⁹ For Saint-Julien, both Derville and Espeel noted a further leasing out of the demesne or lands previously held in customary rent after the Black Death.³⁰ As such, it could be argued that, following Brunel, the contracts still stand relatively close to reality – although they do remain highly susceptible to standardisation, of course.

Furthermore, the incredible adaptiveness of short-term leasehold is also an argument in favour. Previous studies on leasehold in Cambrai and other regions in the medieval and premodern Low Countries have shown that lease contracts were often actively adapted to certain circumstances. After a period of crisis, for example, the demands in contracts were often lowered to attract new tenants and ensure the continuity of the lease.³¹ This constant adaptation of the contracts shows that they did reflect a certain (expected) reality.

Fertile lands, fruitful contracts

Whilst isolated lease contracts are relatively abundant, series of leases for one region and one institution are rare. In contrast to sales or bequests, leases were limited in time, and hence preservation of the document was not evident. This research, however, had the advantage of two beautifully preserved lease ledgers of respectively the semi-ecclesiastic/urban hospital Saint-Julien and the collegial chapter of Saint-Géry, each containing a large number of serial lease contracts of the fourteenth century, a rather unique source in continental West Europe.³² The register of Saint-Julien is the eldest of the two, with contracts ranging from 1328 to 1370 – featuring contracts from before the Siege of Cambrai (1339) and the Black Death. In contrast, the register of Saint-Géry only starts around 1364, with contracts until 1410 – yet it has the advantage of containing a larger volume of contracts.

Both registers show a clear managerial rationale; an alphabetical order was used to differentiate between the different communes where they had lands. The respective administrators also clearly intended the ledgers to serve as a complete registry of all lease contracts, shown by open spaces most likely meant for contracts that – unfortunately – weren’t properly registered. As the contracts for some areas exceeded their reserved space, the clerks began filling in other available sections (Figure 1). In the case of Saint-Julien, the contracts of Cambrai overtook almost all the pages meant for Sirault, Inchy, and Sebourg.

Despite the overflow, there are nevertheless gaps in the registers as well, making it difficult to track the same plots through time. Furthermore, in a few instances, some contracts have been recycled: the year, names, duration, and price were scratched out and replaced. Thus, it is important to note that the registers, despite the good intentions of their creator(s), cannot be considered complete. Notwithstanding these disadvantages, both registers do offer one significant advantage: they were also actively used as a tool for the management of the leases, with notes

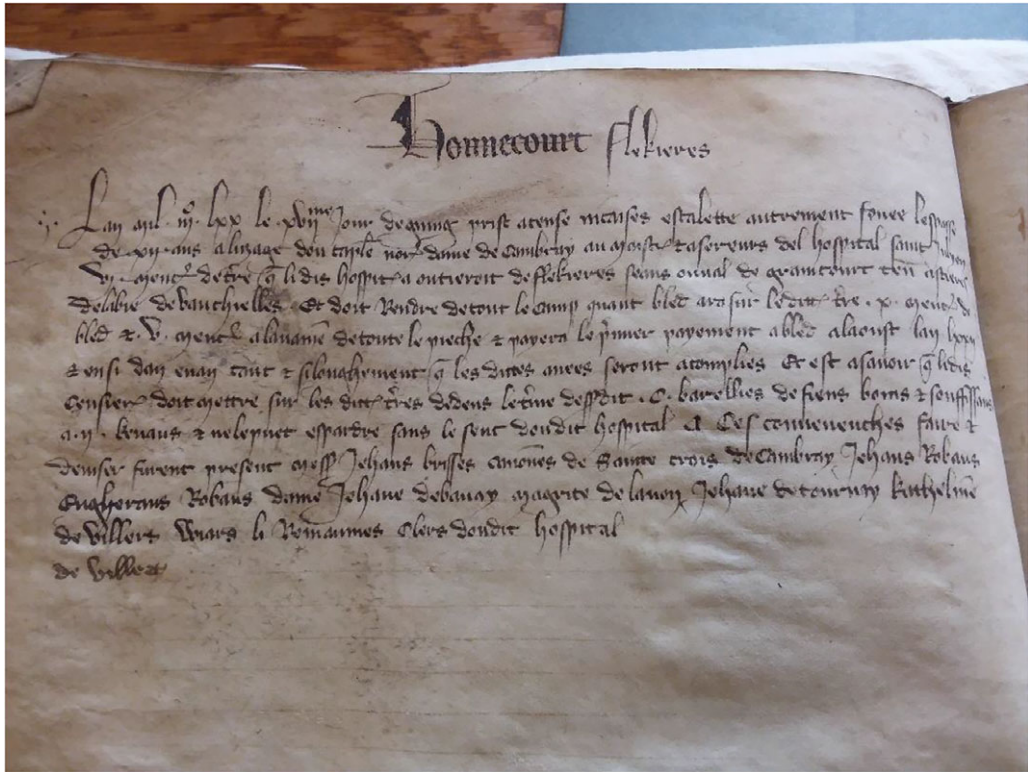
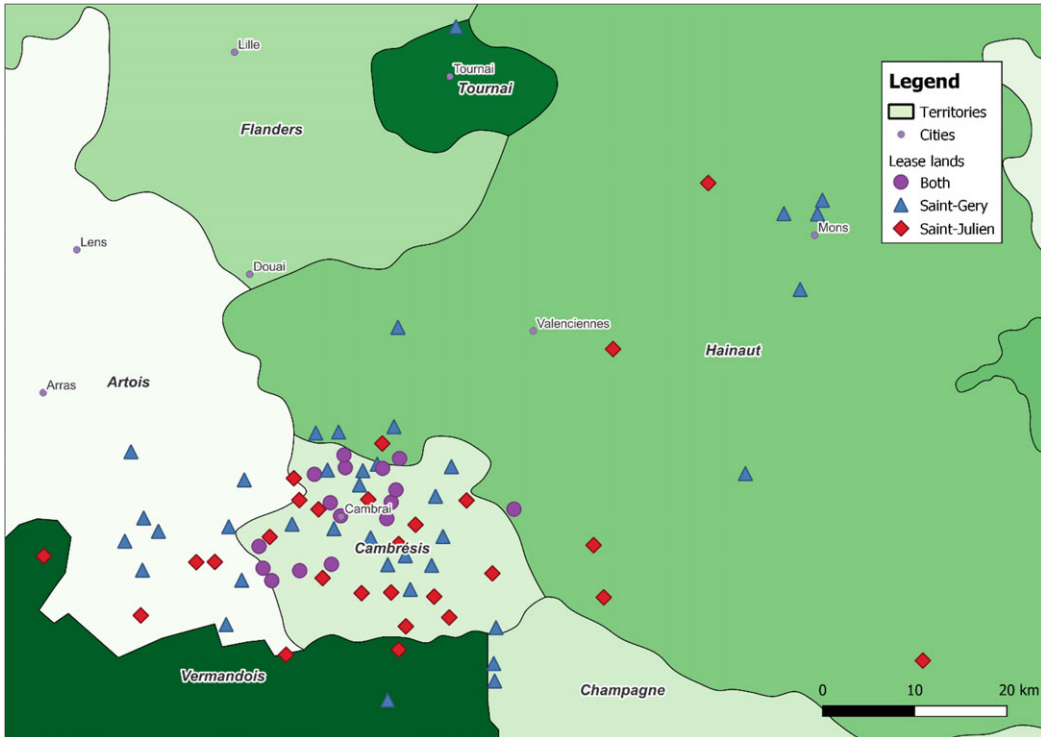


Figure 1. A contract of Saint-Julien for 'Flekieres' (Flesquières) written in the space originally preserved for those of Honnecourt (Honnecourt-sur-Escout).

Source: LLC, 1B.230, f 31v; on lines 6–7 is a clause on fertilisation: '*[et] ledit censier doit mettre sur les ditt[es] t[er]res dedens le t[er]me dessdit c barellies de fiens bonns [et] souffissans*' (and said lessee has to put on the aforementioned land in the term mentioned 100 barrels of manure good and sufficient).

appearing throughout the registers with follow-up upon certain contracts, additional clauses, etc. Particularly noteworthy in the case of Saint-Géry is the inclusion of several 'halfway reports' on the state of the lease, which was required in some of the contracts. These notes either appear in chronological order or have been penned down next to or beneath the contract in question. The different penmanship in the case of the latter and the chronological adherence in the registers both seemingly confirm the ledger as an actively used document and not a post-date collection of contracts.

The contracts themselves almost always contain the usual standard information: the date, the name(s) of the lessee(s), the duration, the (broad) location and an identifying marker of the parcel, the price and payment method, and the witnesses. Noteworthy, those of Saint-Géry seldomly mention the size of the plot, relying on other identification markers. There is also a large degree of variety between the contracts. Some are only two sentences long and contain no extra information. Most, however, contain additional specifications about the payments, for example, the quality and type of crops (often a combination of wheat and oats), the kind of coin – in case of cash payments – and divergent or adjusted payments per year (to account for fallow (cf. *infra*) or fields that need to be brought (back) under cultivation first). Some contracts also contain clauses on manure, which will be discussed further in this paper. Aside from the above, there are also other, less frequent clauses that address other aspects of the lease. The maintenance of the buildings is sometimes mentioned – for example, '*retenir le dte maison avesques les appendanches et*



Map 2. Locations of the lease lands of the Saint-Julien hospital and the Saint-Géry collegial chapter, on level of the communities, 1330–1400.

Not visible on this map: three geographical outliers of Saint-Géry: one in Itegem, in the Duchy of Brabant, and two south in the Champagne, near the Comté de Valois.

Map by Arnoud Jensen, Iason Jongepier, and Léa Hermenault.

apptenanches' (maintain well the aforementioned house with the belongings and attachments), as is the upkeep of trees and hedges – for example *'ne puet cauper le bos ke de v ans'* (do not cut the wood except at five years) or *'il puet caup[er] et planter et faire tout sen proufit [...] excepte les sauls'* (he can cut or plant or do whatever to his profit [...] except the willows).³³ In more rare cases, and only in contracts of Saint-Géry, visitation rights of the lessor are included, for example, *'et pourons si nos plaist le dte maison faire viseter cascun an une fois'* (and [we] can if it pleases us visit the house every year one time).³⁴ Occasionally, some additional rights and clauses are also present, for example, about the shared usage rights of *'trogoirs'* (wax presses) or the obligation of the lessee to report on the exploitation of the land halfway through the lease, etc. Curiously, there are but a few contracts containing clauses on damages, and all of them put the financial burden for damages on the lessee, for example, *'tous frais et damages sont en touces le dit censier a rendre a restorer'* (all destructions and damages are all the above lessee to pay and restore).³⁵ This is in stark contrast with, for example, the documented use of leasehold in Flanders, where contracts often had clauses wherein damages caused by war, floods, etc. would be (partially) covered by the lessors.³⁶

For this research, a broad sample of lease contracts was used, partially to avoid sample bias. The lease contracts of fifty localities were selected for analysis, opting for a selection that represented the full scope of the institutions' possessions, both in terms of geographical spread as in the variety of different lands, soils, and socio-agrosystems (Map 2). This resulted in the analysis of 526 contracts (185 for Saint-Julien and 341 for Saint-Géry) and about 100 extra notes (46 and 54, respectively).

Table 1. The presence of clauses on fertilisation in the lease contracts of Saint-Julien and Saint-Géry

Hospital Saint-Julien		
	Total # contracts	Fertilisation present (% of total)
1320–1330	7	71
1330–1340	27	30
1340–1350	63	22
1350–1360	40	35
1360–1370	40	10
1370–1380	8	38
Collegial chapter of Saint Géry		
	Total # contracts	Fertilisation present (% of total)
1360–1370	64	5
1370–1380	134	8
1380–1390	72	11
1390–1400	60	5
1400–1410	11	0

Note: Due to the low number of contracts in some years, the results for 1320–1330 and 1370–1380 (Saint-Julien) and 1400–1410 (Saint-Géry) are skewed.

Source: database Arnoud Jensen.

Manuring throughout the century: general trends

As stated, the health of soil was a matter of life or death, as it directly impacted agricultural growth and thus the food and income source of its farmers. As each harvest depleted the soil of important nutrients, sustaining soil fertility was a continuous important challenge for these farmers. Furthermore, as time progressed and the commercialisation of agriculture steadily increased, the dependence on additional fertilisation grew as well, as farmers used it to break the fallow and/or up productivity in general. Manure was thus a key element in preindustrial agriculture, especially in regions with poorer soil quality, a high demand for agricultural produce and/or a high population pressure on the available land – yet there was not enough of it.³⁷ The farmyard manure and the nightsoil produced in the cities – even in densely populated areas such as Northern France and the Low Countries – were hardly sufficient.³⁸

Despite its importance, when zooming in on the lease contracts of Saint-Julien and Saint-Géry, clauses on fertilisation appear rather relatively rare (Table 1). In the case of Saint-Julien, such clauses are present in about 20–30% of the contracts on average, whilst for Saint-Géry, it is less than 10% on average. Whilst certainly not in a majority, clauses obligating fertilisation were nonetheless continuously present throughout the century. Whilst its presence fluctuated strongly in the case of Saint-Julien, in the case of Saint-Géry, it remained somewhat around the 10% level.

Of course, as mentioned, the ledgers did not only contain contracts but additional notes as well on a variety of topics (Table 2). The Saint-Julien ledger contained twenty-nine notes concerning fertilisation, each explicitly mentioning witnesses. In the case of Saint-Géry, twenty notes are on fertilisation, but there are also eighteen ‘halfway reports’, which also mention whether parts had been fertilised or not. Not all contracts containing a fertilisation clause have corresponding follow-up notes. Vice versa, the corresponding contract cannot be found for all the notes – though fertilisation might have been expected even if not mentioned, as shown in the opening example of Colars’ renewed contract.

Table 2. Type of additional notes in sample of the ledgers of Saint-Julien and Saint-Géry

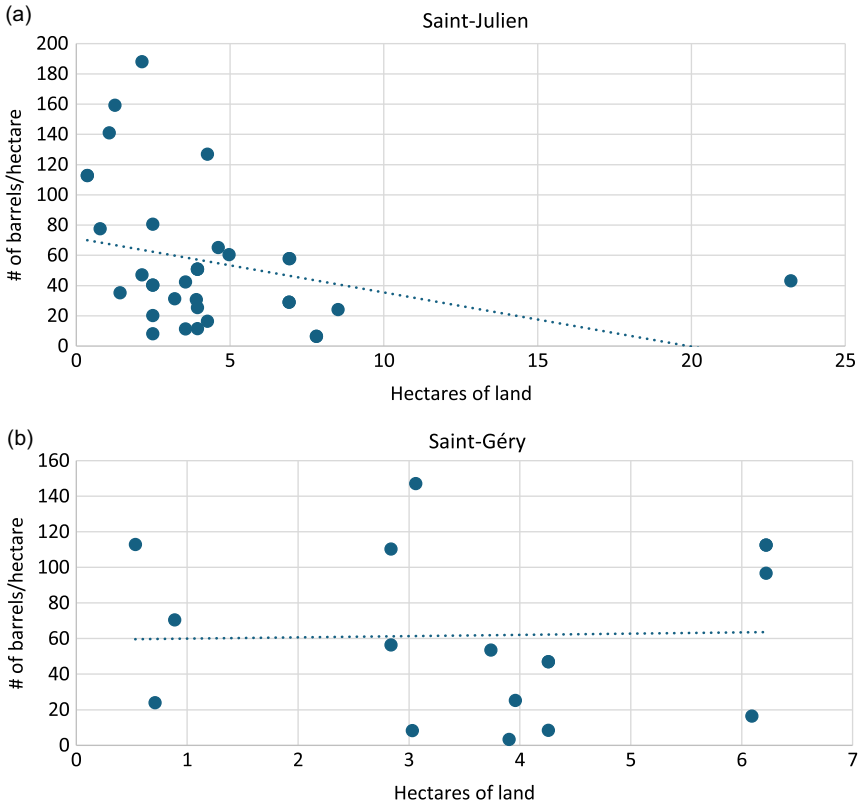
	Institute	
	Saint-Julien	Saint-Géry
Late pay	5	5
Fertilisation	29	20
Additional clauses	9	5
Material investments	0	2
Overview grounds	0	3
Reports	0	18
Varia	2	0
Renewal/take-overs	1	1

Source: database Arnoud Jensen.

Strangely enough, despite their unique character, only two other historians have used these notes: Derville and Neveux. Both mention them in their seminal works on Cambrai and the larger region – though only briefly. Their interpretation, however, varies. Derville mainly advances the narrative that the demands of the leases were lessened over time, to attract new leaseholders in times of sharp demographic shortages throughout the fourteenth century and the post-plague inversion of the land/labour ratios. He considers these notes proof of the lessening of demands concerning manuring, as they showed that the obligated quotas – expressed in *barillies* (barrels) – were never met and lessened over time.³⁹ When looking at the first contract of the aforementioned Colars le Flamand, for example, there does seem to be a large decrease in the amount he applies yearly, steadily decreasing from 380 barrels to a mere 138 between 1384 and 1392. However, in the years of the second contract, he applies between 300 and 700 barrels yearly.⁴⁰ Moreover, the soil does not require the same amount of manure every year. Neveux had a different take when looking at his sample of lease contracts of Saint-Géry, assuming that the quotas in the contracts were not yearly but total quotas. Accounting for the number of years, the demanded amount of manure was met – though with a lot of fluctuation of the amounts used in the separate years.⁴¹ It must be noted that both Derville and Neveux worked with a small sample of the ledgers.

When looking at the contracts themselves, it is indeed not entirely clear how these clauses should be interpreted. If Derville is right, only one lessee, Bede du Croket, meets the quota in the entire period and only in one year, in which he does not just meet the quota of 206 barrels but exceeds it by providing 310 – perhaps to compensate for the severe lack the previous years or to prepare the land for the winter cereals?⁴² Furthermore, considering the latter, in the case of three-year contracts, it would make sense to only manure thoroughly once, for the winter cereals, whilst the other phases in the crop rotation would require less manure or could profit from the *navette* – the remainder of the manure still in the soil. At the least, this would explain the large fluctuations in the amount of manure applied every year.

The argument in favour of Neveux, considering them total quotas, is supported by both the additional notes and the total picture. Considering the *yearly* notes, both institutions had a vested interest in the good follow-up. Especially as in some cases, the witness could be identified as local notaries or other people of high standing within their respective communities; for example, in a note of 1376, the witness Jehan de Meluy is the '*seigneur de Maisencourt*' (lord of Metz-en-Couture).⁴³ In 1396, Jehan le Flamens, a public notary, testifies in Cagnoncles, and in 1398, the



Graph 1. (a and b) The requested amount of barrels manure per hectare, per size of the holdings for Saint-Julien and Saint-Géry. Source: database Arnoud Jensen.

witness in Guny, Jehan Loubiert, is both priest and public notary.⁴⁴ As these witnesses were almost always part of the same local communities as the lessee, there was, of course, a risk that they would act in favour of the lessee. To seemingly alleviate these risks, it makes sense that the institutions would try to rely on people of certain standing.⁴⁵

Furthermore, many of these lessees had their contracts renewed. In the case of yearly quotas, all except Bede would have been severely lacking in the follow-up of an aspect that seemed important enough to involve official notaries – so why would their leases be renewed? An obvious reason for the latter would be the many mortality crises that hallmarked the fourteenth century, with landowners actively adapting their leases to attract new lessees or tempt the ‘old’ ones to stay to ensure the continued exploitation of the lands.⁴⁶ However, in the case of Saint-Géry, research has demonstrated that they had a more profit-aimed management strategy and only made limited allowances towards their lessees in terms of adjustments to the leases. Furthermore, for both institutions, the contracts show high demands of the lessees throughout the entire century, with little to no investment or intervention of the landowners in costs relating to transport, repairs, tools, etc.⁴⁷ Considering this, the fertilisation demands being total quotas makes the most sense, affirming Neveux’s view.

For about fifty-one contracts, in which both the size of the land and the number of *barillies* manure are mentioned, it is possible to calculate the number of barrels per hectare per year (assuming total quotas). There does not, however, seem to be a specific logic at play here, with the numbers varying wildly between 3 barrels per hectare to more than 188 barrels (Graph 1). Although Graph 1a suggests a correlation with the size in the case of Saint-Julien, no statistically

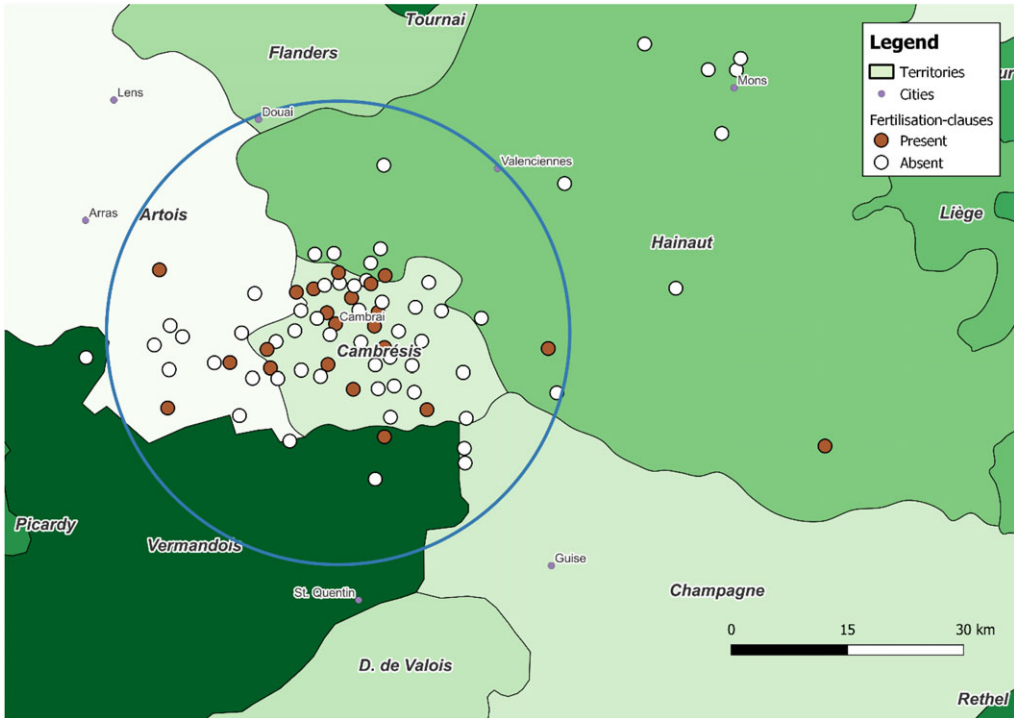
significant correlation could be found with either the size of the plot, the type of soil, or the presence of clauses enforcing crop rotation – nor is there a clear evolution over time noticeable.⁴⁸ Several other factors could be at play here, from differences in negotiation position/status to (local) knowledge about certain lands, but as no further information is found in the sources, the exact rationale behind the demanded quantity of manure remains unknown.

A more thorough analysis is hindered by the fact that the volume of the barrels is unspecified. Considering the amounts mentioned and the requirement that the lessees provided the manure themselves – an expensive investment – it is unlikely that the *barillies* can be equated to the ‘tonneau’ (thousand litres). Unfortunately, no information is preserved concerning the exact volume of a ‘barrel’ as used in Cambrai. From information available on the trade of oil, beer, wine, grains, etc. in barrels in the nearby cities, a broad estimate can be made of about 90–160 litres maximum.⁴⁹

Aside from the size of the barrel itself, the kind of manure also plays a role in determining how many litres fit in a barrel, with, for example, human faeces being denser than animal manure. However, nowhere in the contracts is it stipulated what kind of manure was to be applied to the fields. Typically, there were two main types of fertiliser available in late medieval West Europe: from man and animal (faeces and urea) and natural resources (straw, sods, peat, pulverised lime rock [marling], shells, etc.). Additionally, human waste was also used, like food waste, hearth ashes, etc. The best straw-based fertiliser was created by adding urea and animal manure, so quality-wise, it was still dependent on other sources as well.⁵⁰ Considering the word used, *fiens*, literally ‘excrements’, faeces seem the most likely source. However, the word was also used more broadly to indicate ‘fertiliser’ in the region. Looking at lease contracts in the bordering county of Flanders, it is often indicated that a mixture of faeces (predominantly from animals), straw, and grain husks was used.⁵¹ Considering the proximity and the many exchanges and interactions between farmers, merchants, landlords, clerics, etc. of the county and Cambrésis, perhaps the same mixture was used in Cambrésis.

As most fertilisation clauses can be found in contracts for regions close to the city of Cambrai itself (Map 3), nightsoil was available, although typically a lot of it still went unrecycled. Animal manure is a likely suspect. Thirteenth-century charters show an agropastoral system in many villages in and near Cambrésis.⁵² Also, at the end of the thirteenth century, the village Cagnoncles, near Cambrai, was destroyed, resulting in an inquiry made about the damages. This ‘damage report’ gives a unique view into the village, whilst also revealing the amount of cattle held.⁵³ Horses, cows, and sheep are often mentioned, with an average of 1.5 beasts per household. Although most cattle and especially the horses are only to be found in the richer segment of the commune, the document also reveals peasant ownership of (small) cattle. Furthermore, as Kilby argues based on her research on English peasant communities, the amount of manure that could be produced even through small amounts of cattle should not be underestimated.⁵⁴ Calculations of livestock units are often used to estimate how much manure was produced/available in medieval England.⁵⁵ However, considering we only have a partial view of the livestock of one village, a century earlier, this method cannot be applied here.

Lastly, the accounts of Saint-Julien also point out a type of manure used. As part of the expenses for the exploitation of the hospital’s demesne, a few times a cost is noted for the searching, buying, and spreading of manure (*pour fiens actce kierkier et espardre*).⁵⁶ In most cases, no further information is given aside from the total cost. However, for the years 1355–1356, there is mention of ‘26 barrels of clay bought to manure’ (*XXVI barillies dargille attacee pour fume*).⁵⁷ The deviation from the standard phrase and the significantly lower cost most likely indicate that the use of this ‘clay’ was not the standard practice for the hospital. Additionally, we can wonder whether they meant ‘clay’, or was this perhaps alluvial mud or marl? The latter might be possible, as it not only contains clay but was also available in the wider region – explaining the low cost – and it was generally applied less often than manure, clarifying the rarity of the mention.⁵⁸ However, this use of ‘clay’ as an occasional fertiliser is interesting nonetheless.⁵⁹ Remarkably, there is no direct



Map 3. Location of contracts with fertilisation clauses of Saint-Julien and Saint-Géry, 1328–1400. The blue circle indicates a zone of 30 km around Cambrai.

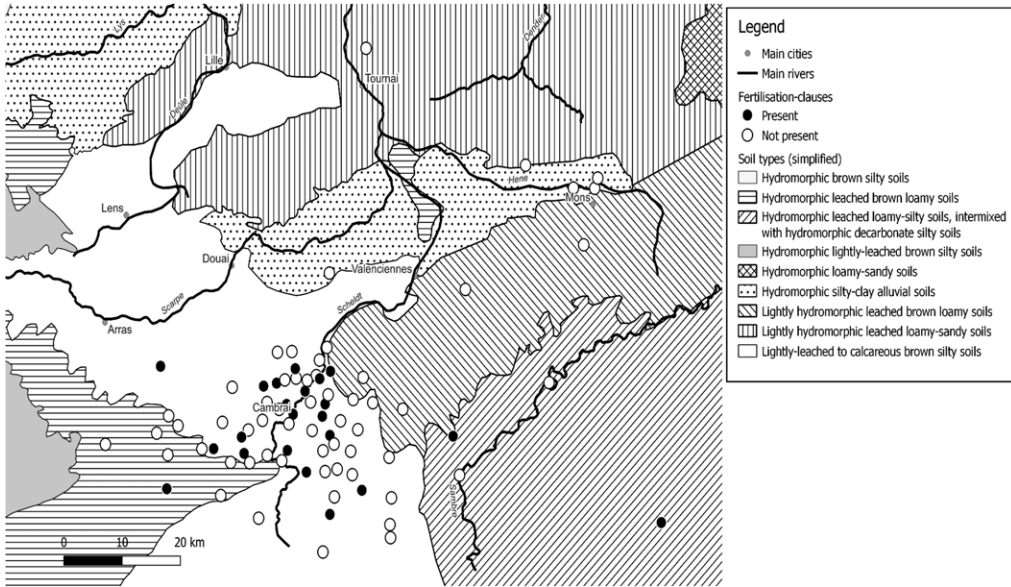
Map by Arnoud Jensen, Iason Jongepier, and Léa Hermenault.

mention of the use of marl or clay in the contracts, but as the term *'fumer'* refers quite broadly to 'fertilise the soil', it might have been implicitly part of the contracts that used the more open phrase of demanding the land to be *'bien fumé'* (good fertilised) instead of quoting specific amounts of barrels.

Picturesque villages and dungy fields

At first glance, it would appear that some rural villages are overrepresented. Whilst there are on average six (Saint-Julien) or nine (Saint-Géry) contracts per village preserved, there are forty-nine contracts of Saint-Julien for Cambrai itself, seventeen for Flesquières, thirteen for Estroumel, etc., and in the case of Saint-Géry, there are a whopping forty-seven contracts for Cagnoncles, twenty-nine for Cambrai, and between seventeen and twenty contracts for Beaufevor, Hordain, Marcoing, Ramilies, etc. A closer look reveals that this is mostly due to multiple entries on the same lessee, like Colars le Flamand in Cagnoncles (Saint-Géry) or Jehan Pullois in Estroumel (Saint-Julien). Interestingly, the ledger of Saint-Julien reveals that the latter was not just responsible for the care and fertilisation of the plot he leased himself but also for the plot leased by *messire* Alars *chevalier* d'Aismel, with specific clauses obligating Jehan to manage and manure the knight's field as well.⁶⁰

There is nonetheless a noticeable geographical element concerning the plots where fertilisation was required by the institutions (Map 3). Although both had lands stretching wide and far from Cambrai, almost all contracts with fertilisation clauses are about lease plots within 30 kilometres from the city, except for a pre-Black Death contract for Ohain (Saint-Julien), about 65 kilometres east of Cambrai. Similarly, both institutions very rarely require payments from lease lands farther



Map 4. Soil types of Cambrésis and the bordering regions.

Note: Not on this map, the banks of the rivers are characterised by alluvial soil. Only the main rivers have been included, not their (many) smaller branches as their exact fourteenth-century path could not be traced as it has been changed significantly by both man and nature.

Map by Arnoud Jensen, based on the French map 'Inventaire, Gestion et Conservation des Sols dans le Nord – Pas de Calais' (Institut national de l'information géographique et forestière, 2010) and the Belgian map 'Associations de Sols – Pédologie' (R. Marechal & R. Tavenier, l'Institut Géographique Militaire, 1971).

than 30 kilometres from the city – except payments combining cash and beeswax in the case of Saint Géry and the above-mentioned exception of Ohain.

Neither the ledgers nor the accounts provide a clear answer on the underlying rationale, although it is likely connected to transport costs and less supervision. As the lessees were themselves responsible for the transport of the grain to the city and of the manure to their fields, high transport costs – especially if nightsoil was used – and risks would be disadvantageous and perhaps too high a demand from the lessees. Additionally, the distance could have impeded the close follow-up of specific contractual demands, concerning crop rotation, fertilisation, etc., which are often present in those demanding in-kind payments.

The exception of Ohain remains another mystery. The land was leased out in 1334 to Nicaïses de Waubais and his wife for twelve years. There is one additional note on the follow-up of the manuring, already in 1334. However, in 1341 – after the Siege – the lease was given to a new lessee for six years this time and with a changed price: a smaller amount of wheat, but more oats. Afterwards, no contracts are registered for Ohain.⁶¹

Another intriguing geographical aspect is the type of soil. The institutions had lands in regions with a variety of soil types (Map 4), from quite fertile alluvial soil to more barren sandy soils and even a few possessions in heathlands. The expectation would be to find more contracts containing fertilisation clauses for the less fertile regions. It is quite notable that both institutions have hardly any (Saint-Géry) to no (Saint-Julien) lease contracts with these clauses for plots on the more fertile kind of alluvial soils. These alluvial soils along rivers often offered excellent pastureland, and arable farming might either be less important, or the availability of manure might be guaranteed through the abundance of cattle. On the other hand, clauses on fertilisation were also absent in most lease contracts for the less fertile sandy soils owned by Saint-Géry, all of which had cash payments rather than in payments.

Yet soil type alone does not explain why fertilisation clauses were present in some regions and not others. For example, such clauses feature in contracts for Thun-Saint-Martin, but not in those for Thun-l'Évêque, even though those two villages are less than a kilometre apart, only separated by a river. Even within the villages, there are differences, with some contracts demanding fertilisation, whilst others do not – as is the case in Thun-Saint-Martin. Two elements can perhaps give more insight here. The first one is the socio-agrosystem, the regional social organisation of agriculture, in Cambrésis.⁶² As mentioned, there was a persistence of open fields and the organisation of the landscape into an infield and outfield system.⁶³ Although the exact situation in Cambrésis at that time is unknown, preserved thirteenth-century charters do show regulations and conflicts surrounding open fields in Cambresian villages like Marquion, Walincourt, Houcourt, Anneux, etc.⁶⁴ Open fields involved pasturing of animals on the arable land after the harvest and hence already a form of fertilisation.

Second, there is the institutional organisation on the level of the communities themselves, with *Flurzwang* being present in some villages. This meant strict control over the agricultural activities within their borders, including control over elements such as manuring and maintenance of the soil health.⁶⁵ Leturcq mentions, amongst others, Marquion, a community to the north of Cambrai, where Saint-Géry had several lease lands.⁶⁶ Not a single mention of fertilisation is made in these contracts. Considering the community already fulfilled a role in managing all aspects of the agricultural exploitations, the canons of Saint-Géry likely did not have to include such clauses in the contracts – which is also observed in other regions where local customs already determined certain aspects of land management. It is highly unlikely that Marquion was the only village in which this kind of system existed, especially considering the small sizes of the communities in Cambrésis, which might further explain why the lease contracts in some regions seemingly contain no references to fertilisation. In the case of the Thun villages, Thun-l'Évêque was a relatively small community, under direct seignorial control of the bishop, whilst Thun-Saint-Martin was more or less owned by Saint-Géry. The collegial chapter had thus more control (or to control) over the management of their lands in Thun-Saint-Martin, whilst they most likely had to adjust their contracts to the existing regulations for their lands in Thun-l'Évêque.

Between peasants and farmers

Another reason some of the villages pop up more than others has to do with the size of the lease plots, as there was a dominance of plots of certain sizes in some villages. Although, as mentioned, the size of the plots or a usable proxy wasn't always mentioned, for 55.14% of the contracts of Saint-Julien and 41.35% of those of Saint-Géry, the information on size was either available or could be closely estimated based on proxies in the contracts. In Table 3, an interesting pattern appears – keeping in mind possible sample bias – with Saint-Julien owning predominantly smaller lease plots, whilst Saint-Géry owns many large leaseholds.

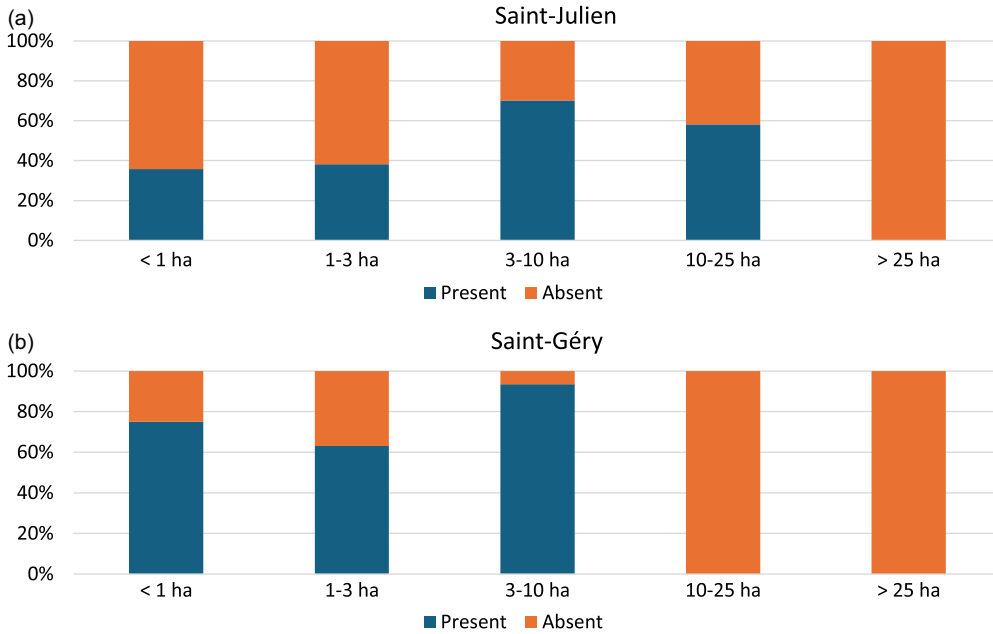
Unfortunately, the group of contracts with size indications doesn't completely overlap with the collection of contracts with fertilisation clauses. For 47% (Saint-Julien) and 61% (Saint-Géry) of the latter kind, there is no data available on the size of those plots. Keeping in mind these gaps, the analysis is nonetheless interesting (Graph 2a and b). For both institutions, no clauses on fertilisation were present in contracts for the largest lease farms (those with an acreage above 25 hectares). On the other hand, most clauses are to be found in contracts dealing with mid-sized acres (3–10 hectares). In the case of Saint-Julien, there are also quite a few of those clauses for the plots between 10 and 25 hectares but significantly less so for the smaller farms (below 3 hectares). On the contrary, Saint-Géry seems to have more such clauses for the smaller farms and none for those between 10 and 25 hectares.

These differences concerning the size of the lease and the contractual demands are quite important. First, it might seem quite surprising that the fertilisation clauses are completely absent

Table 3. Categorisation of lease plots by size, where available, for both institutions

	< 1 ha	1–3 ha	3–10 ha	10–25 ha	> 25 ha	Total
Saint-Géry	9	20	17	2	93	141
Saint-Julien	21	40	38	2	1	102

Source: database Arnoud Jensen.



Graph 2. (a and b) The presence of fertilisation clauses in lease contracts according to size of the lands.
Source: database Arnoud Jensen.

in the contracts for the largest lease farms, especially considering the role of Cambrésis as a grain-exporting region on the one hand and the role attributed to large lease farms in the commercialisation of agriculture on the other hand. In the case of Saint-Géry, half of their larger leases were in the more fertile lands, with alluvial soils – which could partly explain this result; however, the other half was in lesser lands, with loam(y) and even stony soils.

Although there are several factors in play here, two main factors determine this difference between the largest and smaller farms concerning fertilisation: scale and power relations. First, the importance of scale: for the largest farms, scale worked both to their advantage and disadvantage. The larger scale made applying manure an overly expensive and labour-intensive task. Especially in the post-Black Death period, with the rise in wages of unskilled labour, this cost only increased. Second, the scale advantage could already result in higher yields. As La Poutré and others have remarked, when applying manure in the preindustrial period, considering the required input of capital and labour, the returns for smaller farms were often larger than those of the larger farms.⁶⁷

This, however, does not mean that no manure was applied here. Thanks to the burning of Cagnoncles (cf. supra), there is some insight into the villages surrounding Cambrai and the farmers who had the necessary capital to lease out such large farms, as this was an expensive undertaking. Noticeably, it is often the same tenants (or their descendants) that leased these farms; furthermore, they often did so in groups rather than as individuals. The continuity of farmers

among the larger lessees is more pronounced than among the small ones. The typical 'rise of the wealthy tenant farmer' narrative – often connected to the rise of agrarian capitalism – does not (yet) seem to apply here, although the fundamentals are present. Furthermore, the inquiry of Cagnoncles shows that these richer farmers also possessed their own cattle and not in small quantities. As such, although there was no contractual obligation binding them to it, it is not unlikely that they made use of their own cattle to provide manure.

The smaller lessees, however, did face such contractual obligations. It seems contradictory to burden lessees who likely lacked the capital for such an investment. Yet, that might be exactly why both institutions did it – on the one hand, because they wanted to make sure these tenants would make the investment nonetheless and properly fertilise the lands and, on the other hand, because they had the power to do so. Both institutions were powerful and large landowners within Cambrésis, especially Saint-Géry, and thus had a certain advantage in negotiations.

The wealthy farmers who leased the largest farmsteads, however, held two significant advantages over their poorer neighbours: not only did they hold a certain prestige, a status of power, within their communities – which translated to a better bargaining position – but both institutions were also dependent on them. These large farmsteads were incredibly important sources of income for both institutions – especially for Saint-Julien, which derived huge quantities of grain from their larger leases. Yet, as mentioned above, not many people were wealthy enough to carry the financial burden of exploiting lands of that size. As such, the larger leaseholders had a more comfortable bargaining power vis-à-vis their landowners here.

Additionally, not only did the poorer inhabitants of the rural hinterlands of Cambrai not have the status or prestige to negotiate better deals, but they were also the demanding party. Looking at the average lease price per hectare of land, it shows a higher price for the smaller plots (< 1 hectare) in the case of both Saint-Julien and Saint-Géry. On average, Saint-Julien demanded 29.9 hectolitres of grain per hectare for the smallest plots, whilst those of more than 25 hectares paid on average 2.5 hl/ha. Similar, but less outspoken, in the case of Saint-Géry, with 4.2 hl/ha for the smallest plots versus 1.1 hl/ha for the largest. The same is present when looking at the cash payments, with an average of 133.8 solidus tournois/ha for the smallest versus 2.6 s. tournois/ha (Saint-Julien) or 28.2 s. tournois/ha versus 26.6 s. tournois/ha (Saint-Géry). Although in general there is a decrease in lease price per hectare as the sizes increase, the exception here is the lands in the category of 3–10 hectares, which are even the most 'expansive' in the case of Saint-Géry, with an average of 19.5 hl grain/ha. Curiously, this is the same category in which the highest percentage of contracts with fertilisation obligations are found. That these lease prices followed demand can be reasoned from two different angles. First, previous research has clearly shown that lease price was partially affected by demand. Especially research looking into the relation between crises and leasehold (cf. *infra*) has shown that to ensure continuity of the leases in times of demographic shortages, landowners often actively lowered their prices to attract new tenants.

Second, an analysis of lease prices over time reveals three demand-driven changes. For Saint-Julien, there is a high peak in prices for the smallest lease plots around 1340, with an average of 270.7 hl grain/ha or 143.4 s. tournois/ha in those years. Most of these smaller plots were within the city itself (often small gardens and *courtills*), and the sudden high demand was driven by the urban flight of many inhabitants of the hinterland to the safety of the city, as the English and Hainaut troops ransacked the lands surrounding Cambrai in 1339. A second demand-driven change can be noted in the slight dip in prices for the larger plots after the Black Death. Third, in the case of Saint-Géry, there is a significant price hike going on for the plots with a size between 3 and 10 hectares, going from an average of 13.9 hl grain/ha (1360s) to 29.7 hl/ha (1370s), in the mid of a period characterised by many mortality crises. The fact that these prices kept rising nonetheless signifies a high demand.

Because of the high demand for these lands, the lessors held more power and could make more demands, such as enforcing fertilisation by manure. Looking back to the theory/historiography on

short-term leasehold, the likes of Kerridge et al. pointed out that the insecurity of short-term leasing demotivated investment by the lessees. This insecurity might have been further heightened considering the frequent mortality crises. Considering this, it is quite interesting that both institutions used their power vis-à-vis these lessees – at least to a certain extent – to enforce investment in the long-term health of the soil.

Manuring a crisis: evolution through time

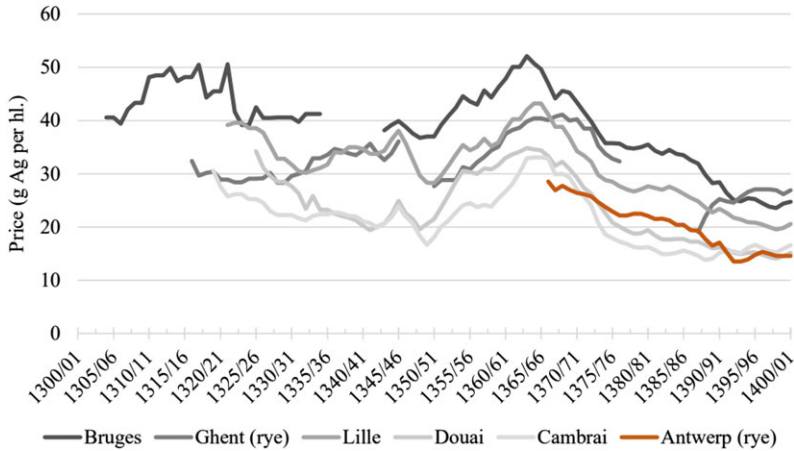
The structural shortages of fertiliser were exacerbated by the many crises that plagued the late Middle Ages. Western Europe was characterised in this period by enduring warfare, epidemics and epizootics, harvest failures induced by extreme weather conditions, and more.⁶⁸ Not only did these crises affect the population and societies as a whole, they also further impaired the availability of manure and increased transport costs. In the past, it had been assumed that *Cambrésis* had remained mostly unaffected by these crises, apart from the siege in 1339 and the Black Death.⁶⁹ Recent research, however, has shown that the region did not go through the late medieval crisis unscathed.⁷⁰

As previously said, the large clerical institutions – the main landowners in the prince-bishopric – actively intervened in their lease contracts. Saint-Julien, for example, offered contracts of a longer duration or temporarily lowered the price after the Black Death. Neither is this region-specific, as Thoen, van Bavel, van Besouw, and others also noted the tendency of landowners in other regions to lower the obligations and demands of lessees in their lease contracts, in an attempt to ensure continuity of the exploitation of the lease during and/or after a mortality crisis.⁷¹ In this regard, based on a small sample of contracts of lands mostly to the west of Cambrai, Derville remarked an immediate and steep decline in both the quantities required and the clauses on fertilisation during the fourteenth century.⁷² Yet, whilst Derville claims that clauses on fertilisation have almost completely disappeared by the end of the fourteenth century, Neveux – using a different, albeit small ($n=10$), sample of contracts of Saint-Géry – argues that clauses on fertilisation are to be found in 95.8% of the cases for the second half of the fourteenth century.⁷³

When zooming in on specific crises, the picture becomes even more interesting.⁷⁴ In line with Derville's theory, a severe decrease in fertilisation clauses is noticeable in the years right after the plague of 1359–1361 for Saint-Julien. However, in the years 1349–1354, right after the Black Death, there is a notable surge in the number of clauses. A similar surge, though not as large, took place in 1369–1374, again right after an epidemic. For Saint-Géry, small but noticeable increases also take place in 1382–1387, 1369–1374, and 1397–1399, each time after epidemics or periods of heightened mortality.⁷⁵ Except for the plague of 1359–1361, there seems to be an increase rather than a decrease in fertilisation clauses after several crises. The many crises did not deter the institutions' concern for the long-term health of the soil.

The presence of these clauses, of course, says little about their content, with Derville also claiming that the amount of manure required lessened. Due to the exact size or location of most lease plots not being mentioned and the fact that each institution almost always had more than one lease plot in a certain village, it is difficult to track plots through time – although not completely impossible. When looking at the contracts of a few trackable lease plots with fertilisation clauses, a quite 'balanced' picture emerges.

For Saint-Julien, the amount of manure demanded was lessened twice and in three instances the clause disappeared with the (re)new(ed) contract, yet in four contracts, a fertilisation clause was newly added. In 1349, for example, right after the Black Death, Nikais de Fiers got a newly added fertilisation clause in his contract in Clary, whilst Maroie Hanette – who took over from her father – had the fertilisation clause removed from hers in Lesdain.⁷⁶ In one instance, in 1367, in the contract for Nicaïses le Brises in Clary, the required amount was heightened from



Graph 3. The long-term evolution of grain (wheat and rye) prices in the region, expressed in grams of silver (to account for devaluation of coin) in the fourteenth century.

Source: Stef Espeel, *Prices & Crises. The Grain Economy in Fourteenth-Century Flanders* (Antwerp, 2021), p. 105.

200 barrels to 450.⁷⁷ Chronologically, these changes happened in correspondence with the general chronological trends noted above. For Saint-Géry, there are nineteen instances of clauses disappearing and eight with the amount being lowered versus seventeen with newly added clauses and five with the amount being increased. In general, the picture is balanced, with the former outweighing the latter only before 1369 – again in correspondence with the general trends, where a steadier evolution through time was noted. The newly added clause in the contract of Jehans Levrens in 1397 in Cambrai, for example, shows that these clauses remained important and certainly did not disappear.⁷⁸ Additionally, the clauses sometimes went and came back, as in the case of Nicaïses de Montegu in Thun-Saint-Martin, whose contract in 1366 no longer had a fertilisation clause, but at the renewal in 1370, a new one was included of 160 barrels. At the next renewal in 1379, the clause disappeared again. In the same commune, a year before, Nicaïses de Greniers, Jehan Blainpain, and their co-tenants received a newly added clause of 600 barrels, which was even heightened to 700 barrels when Jehan Trenchaus took over the lease in 1387.⁷⁹ Furthermore, as the opening example of Colars le Flamand showed, the disappearance or lack of a fertilisation clause, as was the case in his second contract, does not necessarily mean that there are no agreements on fertilisation in place. Although Derville's claim of these clauses disappearing might not be true for the entire corpus of contracts, it does hold for the lands he looked at. His sample was mainly based on lease lands located to the north of the city, which had more fertile soil (the so-called '*plat de Douai*', bordered by the Scheldt and the Scarpe, see Map 4). Aside from soil type, another key factor was at play: changes in grain prices (Graph 3).

Post-Black Death, the grain prices in the region lowered significantly for a short while. However, soon grain prices rose again, until about 1370, after which they declined again. This same increase in grain prices might also explain the sudden rise in demand for the lease plots of 3–10 hectares in this period, as such plots allowed farmers to produce more grain than needed for survival and sell the rest for high profit. As the lands at the east and south of Cambrai, like Clary, were in less fertile soils compared to the north, there was more risk of overexploitation, which might explain the persistence and even increase of fertilisation clauses in those contracts. Considering also the negative effect of many of these crises on the availability and (transport) costs of manure – be it nightsoil or animal manure – the continuous presence of these clauses could also

be seen as a way to further ensure that the fertilisation continued to happen in a period where the expense might have discouraged lessees.

Further research on contracts of the fifteenth century is needed to clarify whether the disappearances of fertility clauses in contracts between 1400 and 1410 can be linked to the lower grain prices or whether it is due to the quite small sample size ($n=11$) for this period.

To maintain with due diligence: soil health

The health of the soil was not only determined by the application of manure, of course. Through a range of techniques, new ways were found to prevent depletion of the soil and to keep up productivity. Crop rotation, for example, allowed for many ways in which the farmer could manage the soil's long-term health: leaving parts fallow, rotating grain with soil-enriching (fodder) crops like vetches or legumes, using manure only for one of the crops (most often the winter cereals), and relying on the '*navette*'. Aside from crop rotation, medieval farmers also managed to keep up or even increase productivity through increases in labour input, technological innovations (improvements to the ploughs, the use of animal traction, . . .), converting new lands to arable acres, etc.⁸⁰ Lease contracts can contain a variety of clauses dealing with all kinds of issues relating to the natural resources of the lease plot.

In several contracts of Saint-Géry, there is explicit mention of making sure the acres return to the lessor '*sans damage*' (without damages). In the case of the contracts of Jehan Trenchaus and Jehans Marchaus in 1392, who both leased a plot in the nearby Thun St. Martin from the collegial chapter, there is also an additional warning coupled with the '*sans damages*', informing them to take care not to over-fertilise the lands.⁸¹ Sometimes the chaplains are also quite specific about what should be manured. For example, Colars le Flamand is told not to manure a certain part of the acres.⁸²

In a few other cases, Saint-Géry also gives certain instructions concerning the soil. When Engherans de Masieres leases a plot in 1399 in the *plat de Farnières*, located in Cambrai itself, he is instructed to 'restore' the ground.⁸³ The year before, Jehan le Bouchier gets more specific instructions, as he is told to augment the soil of a plot of three *mencaudée* (approximately a total of 1 hectare) of his leased lands.⁸⁴ Similar clauses can sometimes be found in the contracts of Saint-Julien: Jakemars Pichos, who leases land in Rumily in 1335, is explicitly warned not to damage the ground.⁸⁵ A certain Mouris, no last name mentioned, is ordered to restore the ground of the plot he leases in Cambrai around 1334, as is Nicaise le Morteas for the plot he leases in Aisne in 1347.⁸⁶

Looking at the contracts, especially the lease prices, it also becomes clear that crop rotation was actively encouraged in some contracts, with the institutions asking for either different amounts or crops depending on the year of the lease. In system with a phase of fallow, the soil gained a much-needed reprieve. Curiously, there are several contracts in the ledger, where the lease price took a phase of fallow in account. Mikeus de la Graincourt, who leased lands in Barastre, Doignes, from Saint-Julien in 1328, didn't have to pay rent for the years that the lands would be left fallow. Furthermore, Mikeus was instructed to leave the lands empty at the end of the lease.⁸⁷ Gillos le Sages in 1368 in Graincourt, Adams Solins in 1371 in Cagnoncles, Lotars de Busqoey in 1389 in Beaufeuve, and others received similar allowances from Saint-Géry.⁸⁸ By not extracting rent in these years, the institutions proactively encouraged the fallow. In some contracts with relatively significant differences in the amount of grain that was to be paid, one could suspect that acres left (partly) fallow were calculated for the years where much less was asked. Considering the soaring prices of manure, this method was the 'second-best solution', although it affected the income of the institutions in the fallow years.

A rotation with a phase of fodder crops was also actively stimulated through the contracts by Saint-Géry. In several instances, they required some of their lessees to pay part of their rent in vetches and/or peas. The use of fodder crops didn't necessarily exclude a fallow phase, as

demonstrated by the aforementioned Adam Solis, who had to pay 45 *muid* grain in year one, nothing in year two (fallow), and 52 *muid* grain (half wheat, half oats), 53 pounds of wax, seven *mencaud* peas, and 200 vetches in year three.⁸⁹

Finally, some contracts do mention specific phrases, instructing the lessees to maintain the lands well, '*comme de bonnes gens*' (like good people), or, in the case of several contracts of Saint-Géry, to '*servete raisonnable*' (maintain reasonably). It would be easy to just catalogue these phrases as being normative, part of the contractual language. However, these phrases appear only in a few contracts, throughout the entire century, with no clear pattern concerning region, length of the contract, or size of the plot. As such, it is not unlikely that these phrases might have been closer to an instruction, invoking due diligence from the lessees, rather than empty contractual idioms.

Conclusion

The long-term health of the soil was important. And it kept being important, come rain or shine – or rather come war or plague. In several instances, both Saint-Julien and Saint-Géry seem to make proactive use of the clauses in the contracts to stimulate and/or enforce good management of the soil and the lease lands in general, encouraging crop rotation, the use of fodder crops, and fallow through the lease price, specifying clauses on the state of the soil, invoking a good and rational management of the lease, and, of course, through the fertilisation clauses.

Although there remains a lot of theoretical debate on whether or not short-term leasehold would encourage investment by the lessees (the Brenner vs. Kerridge debate), it would seem that both Saint-Julien and Saint-Géry assumed that their less affluent lessees were particularly at risk of skipping out on heavy burdens such as fertilisation by manure, of which the effects were mostly felt in the long-term use of the lands. Whether this was due to the insecurity about the renewal of the lease, the heightened insecurity caused by the many mortality crises, or both remains vague. However, it is clear that through these clauses and their follow-up, testified by notaries and other witnesses, both institutions actively used short-term leasehold to try and enforce a form of environmental stewardship of good long-term management of the natural resources of their lands. Of course, this is a very top-down system, with the lessors relying on contractual obligations rather than trusting their lessees to take adequate care of the soil. One could argue that in a non-competitive system of short-term leases, in which farmers have more security to the lease and less pressure to up productivity, these extra incentives would likely not have been necessary, as the farmers themselves would actively profit from investing in the long-term soil health. On the other hand, in that case, it would make sense to only investigate the follow-up of the contract in the latter years of the contract, as lack of manuring in the first years would hit the farmers themselves first, risking income and renewal of the lease. The thorough yearly check-ups show, aside from a reaction to the insecurity, also a personal stake of the administrators in the upkeep of the soil.

This lease strategy isn't present throughout all contracts, yet it is and remains present throughout the entire ledgers, despite all the many severe crises hitting the area and despite the commercialisation of agriculture (most pronounced in the case of Saint-Géry). Both institutions did adapt their contracts in response to the crises but made allowances concerning the general price, the duration of the contract, etc., rather than dropping the 'expensive' demands to fertilise the lands.⁹⁰ Furthermore, the management of the leases also shows that both institutions have a certain knowledge about both the physical and social environments of their lease lands, and adapted their leases to this. The size of the lands and the bargaining position of the lessees also played a vital role, with more clauses to be found for competitive smaller plots

but fewer to none for the largest farms, where the institutions often had a more co-dependent relation.

The unicity of the follow-up notes does show that the ‘additional’ clauses on fertilisation, care for the natural resources, etc. were not just normative contractual elements but reflect actual practices, specifically, in the case of Saint-Julien and Saint-Géry, attention to the management of the soil.

Short-term lease contracts have been a staple of research into the socio-economic history of the preindustrial period for a long time. As this research shows, by looking at these sources anew on a grander scale and by counting in all aspects of the contracts, the complexity and the multifunctionality of leases become clear. New insights into agricultural practices and even in environmental history can be unearthed. Through these insights, the broader narratives on short-term leasehold, the commercialisation of agriculture, the exploitation of natural resources, etc. will certainly be enriched.

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Notes

- 1 Lille, Archives départementales du Nord (ADN), Archives anciennes, Série G – Clergé séculier, 7G – Chapitre Saint-Géry, 7G.1033, Registres aux baux, f 52r.
- 2 ADN, 7G.1033, f 51–53.
- 3 ADN, 7G.1033, f 56.
- 4 ADN, 7G.1033, f 56–57.
- 5 ADN, 7G.1033, f 37, 58.
- 6 Erik Thoen, *Landbouweconomie en bevolking in Vlaanderen gedurende de late middeleeuwen en het begin van de moderne tijden: testregio: de kasselrijen van Oudenaarde en Aalst (eind 13de-eerste helft 16de eeuw)* (Gent, 1988), pp. 792–810; Bas van Bavel, *Manors and Markets: Economy and Society in the Low Countries, 500–1600* (Oxford, 2010), pp. 46–50, 328–342; Pieter De Graef, *Urbs in Rure? Urban manure and fertiliser improvement in 18th-century Flemish farming* (Antwerp, 2016), pp. 23–88; Dino Gülder, ‘Contested Grasslands: Commons and the Unequal Land-Costs to Sustain Soil Fertility in Preindustrial Agriculture’, *Social Science History*, 45 (2021), 625–655; Richard Jones, ‘Understanding Medieval Manure’, in Richard Jones, ed., *Manure Matters. Historical, Archaeological and Ethnographic Perspectives* (Farnham, 2012), pp. 145–158.
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- 8 Philipp Schofield and Bas van Bavel, ‘Introduction. The emergence of lease and leasehold in a comparative perspective: Definitions, causes and consequences’, in Philipp Schofield and Bas van Bavel, eds., *The Development of Leasehold in Northwestern Europe, c. 1200–1600* (Turnhout, 2008), pp. 11–29.
- 9 Alain Derville, *L’agriculture du Nord au Moyen Age* (Paris, 1999), pp. 203–245; Monique Maillard-Luypaert, *Diocèse de Cambrai* (Turnhout, 2024), pp. 3–32.
- 10 Stef Espeel, *Prices and Crises. The Grain Economy in Fourteenth-Century Flanders* (Antwerp, 2021), pp. 91–176; Raymond van Uytven, ‘L’Approvisionnement des villes des anciens Pays-Bas au Moyen Âge’, in Charles Higounet, ed., *L’approvisionnement des villes: de l’Europe occidentale au Moyen Âge et aux Temps Modernes* (Toulouse, 1985), pp. 75–116.
- 11 Louis Trenard, *Histoire de Cambrai* (Lille, 1982), pp. 63–64.
- 12 Derville, *L’agriculture*, 203–245; ibidem, ‘Les chapelains de Saint-Géry de Cambrai au XIVe siècle’, *Le Moyen Âge*, 95 (1989), 255–278; Arnoud Jensen, *Pacht in tijden van oorlog, pest en muntdevaluaties. Besluitvorming in de pacht tijdens de turbulente veertiende eeuw in het sticht Kamerijk* (Antwerp, 2019), passim; Espeel, *Prices and Crises*, 302–342; ibidem, ‘Demesne or leasehold? Estate management in southern Flanders during the price shocks of the fourteenth century’, *Revue belge de philologie et d’histoire*, 100 (2022), 275–304; Maillard-Luypaert, *Diocèse de Cambrai*, 4–10.
- 13 Derville, *L’agriculture*, 203–213.
- 14 Robert Fossier, ‘Fortunes et infortunes paysannes au Cambrésis à la fin du XIIIe siècle’, in Édouard Perroy, pass. ed., *Économies et sociétés au Moyen Age: Mélanges offerts à Édouard Perroy* (Paris, 1973), pp. 171–182; Nicolas Schroeder, ‘Medieval and modern open fields in southern Belgium: a summary review and new perspectives’ in Christopher Dyer, Erik

- Thoen and Tom Williamson, eds., *Peasants and Their Fields: The Rationale of Open-Field Agriculture, 700–1800* (Turnhout, 2018), pp. 183–205; Espeel, *Prices and Crises*, 286–288.
- 15 Thoen, *Landbouweconomie*, 735, 761–775; Samuel Leturcq, ‘Communauté, terroir et champs. Répartir les ressources des champs au Moyen Âge’, in Joseph Morsel, ed., *Communautés d’habitants au Moyen Âge, XIe-XVe siècles* (Paris, 2018), pp. 217–252.
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- 17 *Ibid.*
- 18 Bas van Bavel, ‘Land, lease and agriculture. The transition of the rural economy in the Dutch river area’, *Past and Present*, 172 (2001), 3–43; Jane Whittle, *The Development of Agrarian Capitalism. Land and Labour in Norfolk 1440–1580* (Oxford, 2000); T. H. Aston and C. H. E. Philpin, eds., *The Brenner Debate. Agrarian Class Structure and Economic Development in Pre-industrial Europe* (Cambridge, 2002); Eric Kerridge, *Agrarian Problems in the Sixteenth Century and After* (London, 1969); Michael Turner, John Beckett and Bethanie Afton, ‘Agricultural sustainability and open-field farming in England, c.1650–1830’, *International Journal of Agricultural Sustainability*, 1 (2003), 124–140.
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- 20 Turner et al., ‘Agricultural sustainability’, 128.
- 21 *Ibid.*
- 22 H. P. Santmire, *The Travail of Nature* (Philadelphia, 1975), pp. 75–119; Michael George, ‘Gawain’s struggle with ecology: attitudes towards the natural world’, *The Journal of Ecocriticism*, 2 (2010), 30–44; David Herlihy, ‘Attitudes towards the environment in medieval society’, in Lester Kilsky, ed., *Historical Ecology. Essays on Environment and Social Change* (London, 1980), pp. 100–116.
- 23 Guy Fourquin, ‘Les débuts du fermage: l’exemple de Saint-Denis’, *Etudes rurales*, 22 (1966), 7–81; Bernard Delmaire, ‘A l’origine du bail à ferme dans le Nord de la France’, in Erik Thoen and Jean-Marie Duvosquel, eds., *Peasants and Townsmen in Medieval Europe. Studia in honorem Adriaan Verhulst* (Gent, 1995), pp. 529–539.
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- 25 H. P. Jansen, *Landbouwpacht in Brabant in de veertiende en vijftiende eeuw* (Assen, 1955); Jim van der Meulen, ‘Bargaining river lords. Lordship and spatial politics in premodern Guelders (Fifteenth-Sixteenth Centuries)’, *TSEG – The Low Countries Journal of Social and Economic History*, 18 (2021), 39–71.
- 26 Alain Derville, ‘L’hôpital Saint-Julien de Cambrai au XIVe siècle. Etude économique’, *Revue du Nord*, 70 (277), 286–290.
- 27 See introduction by Erik Thoen in: Paul Lindemans, *Geschiedenis van de landbouw* (Antwerpen, 1952), pp. xv–xvi.
- 28 Ghislain Brunel, ‘Leasehold in northern France in the twelfth and thirteenth centuries: economic functions and social impact’, in van Bavel and Schofield, eds., *The Development of Leasehold* (Turnhout, 2008), pp. 81–99.
- 29 ADN, 7G.1385, Terrier Contehem.
- 30 Derville, *L’agriculture*, 203–245; Espeel, ‘Demesne or leasehold?’, 275–304.
- 31 van Bavel, *Manors and Markets*, 171–177; Bram van Besouw, *On the Economic Consequences of Warfare in Early Modern Europe: Four Conceptual and Empirical Contributions* (Utrecht, 2019), pp. 109–144.
- 32 Respectively: Cambrai, Le Labo-Cambrai (LLC), Archives Hospitalières, Série B, 1B.230, Registres aux baux; ADN, 7G.1033.
- 33 LLC 1B.230, f 18v, f 51v and f 14v.
- 34 ADN 7G.1033, f 81.
- 35 LLC 1B.230, f 12r.
- 36 Thoen, *Landbouweconomie*, 568–569; Lies Vervaet, *Goederenbeheer in een veranderende samenleving: het Sint-Janshospitaal van Brugge, ca. 1275–ca. 1575* (Ghent, 2014), pp. 211, 242; however, a study of the fourteenth-century accounts of Saint-Julien (ADN, Série H, 172H – Hôpital Saint-Julien, 172H.53–90, Comptabilité) shows that investments in ‘repairs’ on their lease lands were frequently made. Further research is needed to see whether this entails lease lands and whether all lessees equally profited from this kind of assistance.
- 37 See note 6.
- 38 *Ibid.*; Harry Kitsikopoulos, ed., *Agrarian Change and Crisis in Europe, 1200–1500* (New York, 2012); Giovanni Federico, *Feeding the World: An Economic History of Agriculture, 1800–2000* (New Jersey, 2005), pp. 5–12, 83–115.
- 39 Derville, ‘L’hôpital Saint-Julien’; *Ibid.* *L’agriculture*, 237–246.
- 40 ADN 7G.1033, f 51v, 53v–54r, 56v, 57v.
- 41 Hugues Neveux, *Vie et déclin d’une structure économique. Les grains du Cambrésis, fin du XIVe – début du XVIIe siècle* (Paris, 1980), pp. 206–210.
- 42 LLC, 1B.230, f 37.
- 43 ADN 7G.1033, f 129r.
- 44 AND 7G.1033, f 87r, f 173r.
- 45 Whether these witnesses were present at the time of the manuring and counted the barrels, or just relied on the information of the lessee about the number of barrels and only checked whether manure was applied in general, remains unknown.
- 46 See note 31.

- 47 Derville, *L'agriculture du Nord*, 237–246; Jensen, *Pacht in tijden van oorlog*, 13–28; however, see the remark in note 36.
- 48 This analysis was done using a multiple regression analysis; all mentioned factors were statistically insignificant.
- 49 Horace Doursther, *Dictionnaire universel des poids et mesures anciens et modernes* (Brussels, 1840), pp. 46–51; Gerard Sivery, *Les comtes de Hainaut et le commerce du vin au 14e siècle et au début du 15e siècle* (Lille, 1969).
- 50 Jones, 'Understanding Medieval Manure', 145–158; De Graef, *Urbs in Rure*, 23–88; Dean Ferguson, 'Nightsoil and the 'Great Divergence': human waste, the urban economy, and economic productivity, 1500–1900', *Journal of Global History*, 9 (2014), 379–402.
- 51 Jan Boon, *Aspecten van de landbouw in het Graafschap Vlaanderen van het laatste kwart der XIVe eeuw tot het eind van de Xve eeuw* (Gent, 1964), pp. 96–98.
- 52 Samuel Leturcq, 'La communauté et les champs (Picardie et Hainaut, XIIe–XVIe siècle)', in Robert Fossier, ed., *les hommes et la terre: l'histoire rurale médiévale d'hier et d'aujourd'hui* (Valenciennes, 2018), pp. 135–156.
- 53 Robert Fossier, 'Fortunes et infortunes', 171–182.
- 54 Susan Kilby, *Peasant Perspectives on the Medieval Landscape. A Study of Three Communities* (Hatfield, 2020), pp. 172–176.
- 55 Ibidem; Bruce M. S. Campbell, *English Seigneurial Agriculture 1250–1450* (Cambridge, 2000), pp. 102–193.
- 56 ADN, 172H.53–90, 54.
- 57 ADN, 172H.62.
- 58 Similar practices of applying marl occasionally are attested for both Flanders and England: Boon, *Aspecten*, 101–102; Campbell, *English Seigneurial Agriculture*, passim.
- 59 There is a possibility that this could also simply refer to clay needed to make barrels. However, no such cost is mentioned ever again, nor are there any payments to a potter.
- 60 Why Jehan Pullois had to do this and whether he was reimbursed for his labour is not clear; LLC, 1B.230, f 24–25.
- 61 LLC, 1B.230, f 41v.
- 62 On socio-agrosystems: Erik Thoen, 'Social agrosystems' as an economic concept to explain regional differences. An essay taking the former county of Flanders as an example (Middle Ages–19th Century)', in Peter Hoppenbrouwers and Bas van Bavel, eds., *Landholding and Land Transfer in the North Sea Area (Late Middle Ages–19th Century)* (Turnhout, 2004), pp. 47–66; van Bavel, *Manors and Markets*, 15–27; Jean-Pierre Jessenne and Dominique Rosselle, 'L'histoire rurale de la France du Nord de la fin du Moyen Âge au xxe siècle', *Revue du Nord*, 2–3 (2008), 303–333.
- 63 Nicolas Schroeder, 'Medieval and modern open fields', 183–205.
- 64 Leturcq, 'La communauté', 135–156; Thoen, *Landbouweconomie*, 735, 761–775.
- 65 Ibidem; Leturcq, 'Communauté, terroir et champs', 217–252.
- 66 Leturcq, 'La communauté', 146–148.
- 67 La Poutré, 'Fertilization by manure', 20–48.
- 68 Bruce M. S. Campbell, *The Great Transition. Climate, Disease and Society in the Late-Medieval World* (Cambridge, 2016); John Abert, *From the Brink of the Apocalypse. Confronting Famine, War, Plague and Death in the later Middle Ages* (New York, 2000); Wim Blockmans and Peter Hoppenbrouwers, *Eeuwen des onderscheids. Een geschiedenis van middeleeuws Europa* (Amsterdam, 2002).
- 69 Alain Derville, 'La conjoncture cambrésienne au XIVe siècle', in Thoen and Duvosquel, eds., *Peasants and Townsmen* (Gent, 1995), pp. 561–572.
- 70 Although Cambrai did not face another direct siege after 1339/1340, other research points out that the prince-bishopric itself was not untouched by later military campaigns, nor did it escape other mortality crises: Neveux, *Vie et déclin; Jonathan Sumption, Trial by Battle* (London, 1999); Jensen, *Pacht in tijden van oorlog*, 11–16.
- 71 van Bavel, *Manors and Markets*, 170–181; van Besouw, *On the Economic Consequences*, 109–144.
- 72 Derville focused on the contracts of 4–5 localities to the north-west of Cambrai, though he does not mention the number of researched contracts; Derville, 'L'hôpital Saint-Julien', 285–318; ibidem, *L'agriculture du Nord*, 237–246.
- 73 Neveux, *Vie et déclin*, 207.
- 74 See Table 1.
- 75 On the local mortality crises: Martine Aubry, 'Les mortalités lilloises (1328–1369)', *Revue du Nord*, 65:257 (1983), 327–342; Derville, 'La conjoncture cambrésienne', 561–572; Hugues Neveux, 'La mortalité des pauvres à Cambrai (1377–1473)', *Annales de démographie historique*, 1 (1968), 73–97.
- 76 LLC 7G.1033, f 18r and 34v.
- 77 LLC 1B.230, f 18r.
- 78 ADN 7G.1033, f 61v.
- 79 ADN 7G.1033, f 170v–173v.
- 80 van Bavel, *Manors and Markets*; Thoen, *Landbouweconomie*.
- 81 ADN, 7G.1033, f 173.
- 82 ADN, 7G.1033, f 52.
- 83 ADN, 7G.1033, f 81.
- 84 ADN, 7G.1033, f 135; a mencaudée in Cambrai was equal to about 0.355 hectares (Derville, *Agriculture du Nord*, 13).
- 85 LLC, 1B.230, f 43.

86 LLC, 1B.230, f 4 and f 13.

87 LLC, 1B.230, f 5.

88 ADN, 7G.1033, f 25, 49 and 85.

89 ADN, 7G.1033, f 49; the mencaud is approximately 0.5634 litres wheat or 0.8445 litres oats, and a muid is approximately 16 mencaud; see Derville, *Agriculture du Nord*, 13.

90 Jensen, *Pacht in tijden van oorlog*.