

**Knowledge and
Potato Blight:
Historicizing Expertise in
the Dutch Nineteenth
Century**

Master's thesis History and
Philosophy of Science

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Date: July 2024



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Introduction

The potato first caught my interest for it travelled the world not as an export product, but as a subsistence crop. When it arrived in Europe in the sixteenth century, the potato slowly acclimatised before being adopted as a food among peasants throughout the continent.¹ Being a tuber, the potato has some unique characteristics that defined its circulation within European society: tubers are reproduced mostly asexually, making them vulnerable to disease over prolonged periods of cultivation, they grow well on poor land, where they yield a nutrient-rich product that can feed many mouths, and they germinate or rot quickly compared to other crops, so that exchanges of tubers happen typically locally. While elite circles initially stayed away from the potato, the crop was cherished for its unique qualities by people and communities living on the margins of society, where peasants, as a result, decreasingly experienced famine. As such, Francesca Bray argues that history of science accounts of the potato have great potential to uncover the role of neglected actors in the making of knowledge.² Through their tuber-ness and rooty-ness, the crop can reveal how science was interweaved by politics, morality, habit, and feeling and recuperate subaltern human and non-human agency in the process of knowledge creation. Being traditionally a peasants' crop with the potential to explore farmers' ways of knowing, the potato ultimately became the topic to pursue in my thesis.

Several authors put the potato amidst history of science research. Rebecca Earle notices the significance of the potato for Enlightenment thinkers and argues that Enlightened discussions about potatoes were inseparable from new ideas about 'population' and governance.³ At the end of the eighteenth century, a nation's population became a resource for the state to be utilized and, as a foodstuff, the potato was recognised as an important means to generate a healthy population. Elite discussions about potatoes thus revolved around their health benefits for labourers and the ways their cultivation could be improved. Earle furthermore highlights the importance of peasants in informing such discussions. Tithe disputes show that potato cultivation became established in cottage gardens throughout Europe in the first half of the eighteenth century, well

¹ John Reader, *Potato: A History of the Propitious Esculent* (New Haven: Yale University Press, 2009).

² Francesca Bray, 'Underground Inspirations: Tuber Sciences and Their Histories', *Isis* 112, no. 3 (1 September 2021): 548–63, <https://doi.org/10.1086/715436>.

³ Rebecca Earle, *Feeding the People: The Politics of the Potato*, 1st ed. (Cambridge University Press, 2020), <https://doi.org/10.1017/9781108688451>; Rebecca Earle, 'Promoting Potatoes in Eighteenth-Century Europe', *Eighteenth-Century Studies* 51, no. 2 (2017): 147–62, <https://doi.org/10.1353/ecs.2017.0057>.

before agronomists took an interest in potatoes. The resultant dynamic between peasants and Enlightened reformers was complex; Attempts to transform local agricultural practices out of a desire to build a prosperous nation were regularly met with resistance as reformers were less familiar with potato cultivation than the people they tried to educate. Earle thus uses the potato to shine a new light upon the dynamics between farmer and scientific knowledge during the time that agriculture became a hotly debated political subject.

Whereas Earle brings forward the agency of peasant farmers in the making of potato knowledge, Emma Spary problematizes the political dimension by looking at the historical construction of nutritional experts.⁴ She investigates the Enlightenment as the period in which expertise emerged as a central feature of modern society, mediating between centralized bureaucracy and individual action. However, by historicizing expertise, Spary argues that its construction was unstable and controversial. She shows, for example, that potato expertise was refigured in the transformation of a French economy guided by moral management to one informed by statistics and calculation, as the crop became a Republican symbol of plenty. In the process, nutrition scientists moved from the scientific institutions of the Old Regime to the administrative machinery of the French Republic. Spary thus underscores how expertise was historically reimagined as regimes changed.

John Lidwell-Durnin adds to the historiography by describing how, in Great Britain, agricultural statistics not only emerged as a state initiative to guide national policy-making but also as a citizen-driven project to improve British agriculture.⁵ He shows how farmers and cultivators, guided by patriotism, exchanged data about potato cultivation in journals such as *The Irish Farmer's and Gardener's Magazine* and the *Gardener's Chronicle*. Lidwell-Durnin argues that the exchange of data flourished in response to agricultural crises and potato diseases and that farmer observations were increasingly acknowledged within the agricultural press as authentic sources, for lacking the knowledge to interpret their data scientifically. Moreover, he highlights the importance of cultivator understandings of disease mechanisms in making sense of the data exchanged, as the occurrence of potato diseases such as curl was related to bad cultivation practices. Lidwell-Durnin suggests that the universal destruction of potato

⁴ E. C. Spary, *Feeding France : New Sciences of Food, 1760-1815*, 1 online resource (xii, 418 pages) : illustrations vols, Cambridge Social and Cultural Histories; 19; No. 19 (Cambridge: Cambridge University Press, 2014), <https://doi.org/10.1017/CBO9781139381185>.

⁵ John Lidwell-Durnin, 'Cultivating Famine: Data, Experimentation and Food Security, 1795-1848', *The British Journal for the History of Science* 53, no. 2 (June 2020): 159-81, <https://doi.org/10.1017/S0007087420000199>.

harvests by the potato blight interrupted this ‘citizen-led project’ as it proved impossible to finetune cultivation techniques to fight this disease. Just as Earle and Spary, Lidwell-Durnin unravels the dynamics between knowledge production and the emerging modern nation-states by focusing on the mundane and everyday potato.

The problem posed by the above-mentioned authors concerns the agency of actors from outside institutionalized scientific enterprises in the process of making knowledge. Earle highlights peasant farmers, Spary political movements, and Lidwell-Durnin citizen networks. Whereas Earle suggests knowledge flowed bottom-up, as peasant farmers informed scientific investigation, Spary suggests that regime changes, in a top-down manner, crafted the conditions for scientific expert knowledge. The potato cultivators in the citizen networks analysed by Lidwell-Durnin suggest, moreover, that citizens organized themselves around a perceived need for potato knowledge. Together, they show that expertise was crafted in an assemblage of sites, people, and beliefs. Less clear from their analyses, however, is how these different groups of people related to each other in the constitution of expertise and how their contributions to expert potato knowledge changed over time. I aim to show how different groups – peasant farmers, landowners, elite reformers, and scientists – imagined expertise differently and played key roles in the public dissemination of potato knowledge.

The central question in my thesis is how potato expertise was constituted in the Netherlands from the Enlightenment until the potato blight. By shifting the geographical focus to the Netherlands, I look into a relatively unexplored region of potato cultivation. While there have been accounts of potato cultivation in the Netherlands, a history of science framework is lacking.⁶ Moreover, I think the Netherlands is an interesting case for international comparison. Given the small size of the country, the Netherlands has always been susceptible to foreign influences, also when it comes to agricultural innovation in the nineteenth century. At the same time, however, the country experienced a distinct impulse for agricultural reformation, as the early nineteenth-century Dutch citizen longed back to the economic prosperity of the Dutch Republic.⁷

⁶ Jan Bieleman, *Five Centuries of Farming: A Short History of Dutch Agriculture 1500 - 2000* (Brill | Wageningen Academic, 2010), <https://doi.org/10.3920/978-90-8686-693-9>; D.E. van der Zaag 1926-1996., *Die gewone aardappel : geschiedenis van de aardappel en de aardappelteelt in Nederland* (Wageningen: [s.n.], 1999).

⁷ James C. Kennedy, *A Concise History of the Netherlands*, Cambridge Concise Histories (Cambridge, United Kingdom ; New York, NY: Cambridge University Press, 2017).

The timeframe I choose for my investigation overlaps with the studies from Earle, Spary, and Lidwell-Durnin, but furthermore includes the potato blight. By starting with the Enlightenment, I want to examine how the French initiatives of agricultural reformation translate to the Netherlands. I also question the importance of statistics for Dutch potato expertise in line with Lidwell-Durnin. The weight of my research, however, is focused at the Dutch response to the potato blight. The potato blight is best known for its impact on Ireland – known as the Great Famine – but resulted in harvest failures across Europe.⁸ As the potato had acquired the status of a staple crop at this time in the Netherlands, also there the potato blight caused famine and epidemics. The significance of the crisis is reflected by the amount of attention given to the matter in newspapers and by individual scientists. I am especially curious to learn how potato expertise was repurposed and reimagined in light of the crisis felt by the potato blight.

By choosing to wield the notion of expertise as an analytical concept, I side with Spary in her understanding of expertise as a central feature of modernity. Contrary to science, I believe expertise is always constituted in a public space, as it aims to inform both governments and those who are governed in their actions. Also, expertise means something different from science in the sense that an unschooled person can become an expert by adhering to unscientific knowledge or skills gained by personal experience. I believe, furthermore, that expertise can reside both in groups of people and individuals. My usage of expertise is therefore inspired by scholarship in social epistemology. Social epistemology questions how people rely on others when seeking information and how reliance on others relates to the epistemic quality of the information sought after.⁹ Testimony, in this light, is up for debate as a justified means of gaining knowledge. By focusing on newspapers as a new nineteenth-century medium for testimony, I want to tap into recent debates about the role of technology in shaping the epistemic value of testimony. Overall, I hope the notion of expertise allows me to analyse how knowledge was sought after by various people to inform state and potato cultivator action.

⁸ J. C. Zadoks, 'The Potato Murrain on the European Continent and the Revolutions of 1848', *Potato Research* 51, no. 1 (March 2008): 5–45, <https://doi.org/10.1007/s11540-008-9091-4>.

⁹ Alvin I. Goldman, 'A Guide to Social Epistemology', in *Reliabilism and Contemporary Epistemology: Essays* (Oxford University Press, 2012), 221–47, <https://doi.org/10.1093/acprof:oso/9780199812875.001.0001>.

Sites of expertise

My thesis starts with a discussion of Dutch potato expertise before the potato blight (chapter 1). This period is characterized by learned societies, national agricultural statistics, and local agricultural communities. Learned societies were groups of mostly elite men who gathered sociably to practice the arts or the sciences. This citizen-led initiative to acquire potato knowledge was contrasted by a state-sponsored initiative to map Dutch agriculture statistically. Lacking a strong national impulse to orchestrate Dutch agriculture in the early half of the nineteenth century, agricultural communities that were more representative of farmers popped up from the 1830s onwards. While this period is marked with intentions to transform Dutch agriculture by expert involvement, I argue that it was most of all a period of community-building, as societies and corresponding networks emerged as spaces for the constitution of expertise, while their impact on both national policy and daily agricultural practices was marginal. In the process, however, peasant practices and cultivator experimentation were crafted as authoritative sources of knowledge.

I show that, during the potato blight, newspapers emerged as a new dominant platform for the constitution of potato expertise (chapter 2). Mid-nineteenth-century newspapers were a driven force between the modernization of the Netherlands and they increasingly played a role in political group formation. By using a Digital Humanities approach, I am able to characterize the wealth of newspaper articles mentioning the potatoes during the potato blight – more than 30,000. My methodology comprises the use of wordcounts to map the press coverage temporally and geographically and the use of word embeddings – quantitative representations of words – to systematically search the Delpher online newspaper archive based on keywords. I also look at the way the scientific connotation of potato changed over time. The findings suggest that the potato blight engaged a group of potato cultivators in newspapers, who found opportunities to adapt to the potato blight in the many reports of potato blight occurrences. These reports were published seasonally and provincially and were contextualized by disease mechanisms, cultivation practices, and food security issues. My research indicates that newspapers provided a public sphere where different accounts of the potato blight, farmer and scientific, stood in dialogue with each other and that testimony was crafted as a legitimate source for expert knowledge.

Finally, I question how scientists positioned themselves amidst the abundance of literature about the potato blight as reflected by the newspaper articles (chapter 3). I look at three prominent scientific

contributions to the public debate about the potato blight, each coming from a different background – chemistry, hygienics, and agronomy. I argue that these scientists, more specialized and research-focused compared to the period preceding the potato blight, were engaged in demarcation practices to make their research socially relevant. I furthermore revisit the agricultural statistics to show that this citizen-driven science project flourished due to the increased attention to potatoes. While statistical data proved useful in taking measures against the potato blight, professional scientists mainly took the potato blight to advance new research programmes.

Taking written sources as my source material, I do not provide an unbiased analysis of potato knowledge in the nineteenth-century Netherlands. First, it should be noted that I do not touch upon tacit knowledge about potatoes, as I believe such historiography should emerge from a dialogue of archival sources with material history or by reenacting historical cultivation practices. Second, my research geographically prioritizes the northern and coastal provinces of the Netherlands, as they were more literate and more market-oriented than southern and inland provinces.¹⁰ Especially Groningen and Friesland knew a rich middle class of gentleman farmers, leading to rich historical sources, but leaving provinces such as Brabant and Limburg relatively unexplored. Still, I believe my analysis of Dutch newspapers is representative of the Netherlands as a whole.

Besides adding to the historiography of potato knowledge and history of science, I hope to inform contemporary debates about the role of expert knowledge in a representative democracy. Agricultural expertise, specifically, seems to have become a heated topic, as the Dutch nitrogen crisis exemplifies. As my historical account of potato knowledge shows, the role of expertise within society is subject to change and, furthermore, up for debate. Expertise can involve citizens in its creation or scientists who practice their research in isolation. My thesis shows that expertise is pluriform and that different ways of knowing can coexist.

¹⁰ Richard Paping and Vincent Tassenaar, '8. The Consequences of the Potato Disease in the Netherlands 1845–1860: A Regional Approach', in *When the Potato Failed. Causes and Effects of the Last European Subsistence Crisis, 1845-1850*, ed. Richard Paping, Eric Vanhaute, and Cormac O Grada, vol. 9, *Comparative Rural History of the North Sea Area* (Turnhout: Brepols Publishers, 2007), 149–83, <https://doi.org/10.1484/M.CORN-EB.4.00024>.

1 Getting to know potatoes

Dutch elite interest in the potato caught on at the end of the eighteenth century, when the crop increasingly appeared in Dutch literature. The reverend Johannes Florentius Martinet praised the potato in his popular scientific work '*Katechismus der Natuur*' (1779) for securing the fatherland against famine for five years in a row.¹¹ Also, the dictionary '*Algemeen Huishoudelijk-, Natuur-, Zedekundig-, en Konst- Woordenboek*', published in 1786, included an entry on potatoes, describing the crop, its cultivation, and its usage. The potato was referred to as a 'most useful crop, about which one may remark that it has by now climatized to our country, and it is also carefully cultivated throughout Europe'.¹² Concerning the usage, the entry mentioned that, previously, doctors had deemed the potato as extremely harmful to human health, but that experience taught people that it is not, and that potatoes are in fact a blessing to poor municipalities, as they are cheap and families can survive by eating potatoes only. Contrary to earlier herbalists who had written mostly about the medical qualities of the potato, late eighteenth-century authors proclaimed the potato for its usefulness.

Elite interest in the potato stood in an international context. Rebecca Earle describes how the attitude towards potatoes changed quickly in the second half of the eighteenth century in France.¹³ While François Quesnay, physician and économiste, still voiced dismissal of potatoes in the entry for 'farmers' in the 1756's *Encyclopédie*, by the 1790s, scientists and statesmen alike actively promoted the potato for its nutritious value and, moreover, its ability to contribute to the nation's wealth. Earle argues that the extensive writings about potatoes by enlightened philosophers and economists, such as Antoine-Alexis Cadet de Vaux, Antoine Laurent Lavoisier, and Antoine-Augustin Parmentier, can only be understood in light of the emergent tendency to govern over the biological aspects of human life, as it has been characterized by Michel Foucault. A most notable change was the emergence of the concept 'population' in relation to the prosperity of a country. In this spirit of population management, the cultivation of potatoes (and also quinoa, white rice, and maize) was advocated by elites for its potential to nourish the people. Relatively unexplored by Earle, however, is the way Enlightened discourse was informed by farmer knowledge about potato cultivation.

¹¹ J.F. Martinet, *Katechismus Der Natuur*, vol. 3 (Amsterdam: Johannes Allart, 1779), 327.

¹² J.A. De Chalmot and M. Noel Chomel, *Algemeen Huishoudelijk-, Natuur-, Zedekundig- En Konst-Woordenboek*, vol. 1 (Campen: J.A. de Chalmot, 1786), 24–26.

¹³ Earle, 'Promoting Potatoes in Eighteenth-Century Europe'.

In this chapter, I ask what aspects of potato cultivation became the object of expert knowledge during the late Dutch Enlightenment and how expert authority was assured. As for France, Dutch turn-of-the-century interest in the potato should be understood in reference to new ideas about governance. Usefulness, as with which the potato was associated in the Netherlands, had a patriotic connotation and signified the improvement of the wealth of the Dutch nation. Such improvement was motivated by an experience of national decline since the time of the Dutch Republic when the Netherlands had a hegemonic position in international trade, which was lost over the eighteenth century.¹⁴ Around 1780, the Dutch elite clung to a specific strand of Enlightenment ideology called *Oeconomie*, which meant as much as national housekeeping. People adhering to the *Oeconomic* ideology sought to transform local industries, which were perceived as backward, through the application of science-based solutions. In that way, these local industries would become embedded in a national economy and contribute to the wealth of the Dutch nation.

Oeconomie was manifested both by learned societies and by the Dutch state, and I will show how they respectively sought to construct expertise. Societies are known to be a characteristic feature of Dutch late eighteenth and early nineteenth-century society.¹⁵ As the prominence of Dutch universities dwindled over the course of the eighteenth century, elite and middle-class gentlemen gathered to practice the arts and the sciences collectively in a societal setting. Two societies specifically addressed national problems as a means to improve the Dutch economic situation: the *Oeconomische Tak* and the *Maatschappij tot Nut van't Algemeen*, of which the *Oeconomische Tak* displayed a keen interest for agricultural reformation specifically. My examination of the potato treatises published by the *Oeconomische Tak* suggests that expertise constituted in this societal context focused primarily on understanding potato cultivation techniques. By contrasting treatises from the *Oeconomische Tak* with a Flemish work by doctor Petrus Joannes van Bavegem about a potato disease named curl, I show that the society-oriented character of the *Oeconomische Tak* resulted in a much more positive appreciation of farmer knowledge than was the case for academically oriented scientists.

While the main interest of the *Oeconomische Tak* laid in the improvement of cultivation techniques, the Dutch state was interested in an overview of national agriculture based on similar *Oeconomic* motivations. Expertise sought after by the Dutch government was

¹⁴ Kennedy, *A Concise History of the Netherlands*, 243–62.

¹⁵ Kennedy, 301–5; Ad Maas, 'Civil Scientists: Dutch Scientists between 1750 and 1875', *History of Science* 48, no. 1 (March 2010): 75–103, <https://doi.org/10.1177/007327531004800103>.

therefore not only focused at different aspects of potato cultivation but also constituted by a different infrastructure. From 1805 onwards, a corresponding network of agricultural commissions aimed to statistically map Dutch agriculture and published their findings in an annual report. Research on data-gathering infrastructures by Lidwell-Durnin shows that similar networks in Great Britain reinforced the farmer conception that agricultural data only made sense in a framework of cultivation methods and disease occurrence.¹⁶ I argue that the same was true for the Netherlands, as correspondents held a remarkable freedom to decide how to complete the questionnaires they received. I will furthermore discuss how the inconsistency of the data gathered related to the disparate nature of Dutch agriculture itself.

A lack of applicability of the expertise constituted by the *Oeconomische Tak* and Dutch state resulted in a marginal impact on both daily farmer practices and national policymaking. Van der Poel suggests that the absence of farmer representation in learned societies and agricultural commissions was a contributing factor.¹⁷ Farmer representation improved during the second wave of agricultural reformation in the 1830s and 1840s when agricultural societies driven by a philanthropic ideology emerged locally. I look into one of them – the Friesian Society for Experimental Agriculture – to examine how expertise was reimaged in a provincial setting. The case of the Friesian society suggests that expertise became entangled with other socio-economic services to the local agricultural community, as insurance of the quality of Friesian potato varieties was recognized as a way to protect Friesian agricultural commerce. I furthermore argue that the founder of the society, Julius Vitringa Coulon, can best be characterized as a ‘civil scientist’, a category proposed by Maas to understand the socially engaging role Dutch scientists played at the time.¹⁸ Overall, this chapter shows how the potato became the object of expertise in three distinct communal settings: a prominent learned society, a corresponding network of agricultural commissions, and a local provincial society.

The *Oeconomic* citizen: learned societies

The *Oeconomische Tak*

The *Oeconomische Tak*, founded in 1777 as part of the *Hollandsche Maatschappij van Wetenschappen*, shows how potatoes

¹⁶ Lidwell-Durnin, ‘Cultivating Famine’.

¹⁷ J.M.G. van der Poel 1920-1997., ‘Heren en boeren : een studie over de commissiën van landbouw, (1805-1851)’ (Wageningen, Veenman, 1949).

¹⁸ Maas, ‘Civil Scientists’.

became the object of knowledge production in societies inspired by *Oeconomie*. By the use of prize questions, the society sought to promote science geared towards the improvement of local industries, such as the textile industry, fishery, and agriculture. The resultant treatises were meant to inform peasant practices so that local industries would advance and become embedded in a national economy. The topics of the prize questions were all over the place, inquiring into the breeding of silkworms, the construction of watermills, and the production of pocket watches, among many other things.¹⁹ Bierens de Haan describes how the enterprise of the *Oeconomische Tak* was informed by idealism and a lack of insight into the Dutch economic reality, resulting in limitless optimism.²⁰ While the *Oeconomische Tak*, therefore, hardly had impact on the Dutch industries it tried to improve, its interest to do so reflected a new elitist attitude towards the daily lives of peasants. I will show how this new interest in peasants' lives constructed local practices and cultivator experimentation as sources for expert authority by examining agricultural treatises published by the society, stored by the *Noord-Hollands archief*.²¹

Over fifty years, the society published five treatises related to potato cultivation. The topics included the usage of potatoes as winter fodder, the growth of potato seeds, tools for potato cultivation, and the decay of potato cultivation. The treatises were written by five different authors coming from five different places in the Netherlands, located in provinces of Utrecht, Noord-Holland, and Gelderland (Figure 1). Several authors identified as *landmannen*, by which, I believe, they underscored their personal relation to potato cultivation. These potato cultivators were relatively wealthy since they owned land that they could rent out to peasant farmers. Notably, two *landmannen* writing about the growth of potato seeds used a significant amount of their fields to try their results. Besides personal experimentation, local observation was the main way to acquire potato knowledge. The treatise by Jonathan Busser, a gentleman living in Zutphen, exemplifies how correspondents crafted peasants as authoritative sources within *Oeconomic* discourse.

¹⁹ J. Bierens de Haan, *Van Oeconomische Tak Tot Nederlandsche Maatschappij Voor Nijverheid En Handel, 1777-1952* (Haarlem: H. D. Tjeenk Willink & Zoon N. V., 1952), 71.

²⁰ Bierens de Haan, 43.

²¹ 'Gedrukte Verhandelingen Landbouw, 1780-1844', n.d., 609.931, Noord-Hollands Archief, <https://hdl.handle.net/21.12102/E3AB5B829FCE4D9096D784AEF0229C7B>.

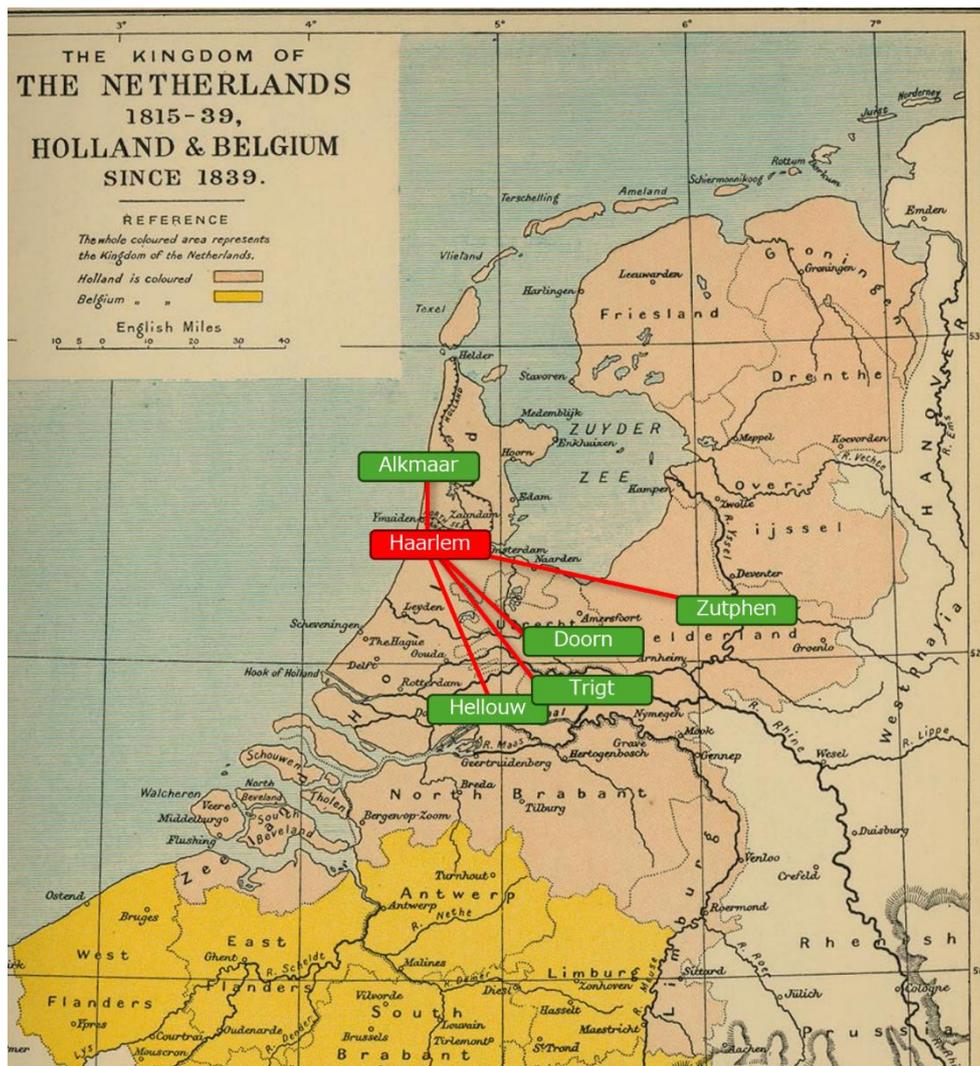


Figure 1: map of the Netherlands indicating the headquarters of the Oeconomische Tak in Haarlem (red) and the towns from which authors of potato treatises wrote (green).

Busser wrote about the usage of the *Roomsche aardappel*, a specific potato variety, as fodder during the winter.²² About the origin of these potatoes, he said that ‘even here people don’t know from where they originally are; people speculate that they are from Germany and were later brought to the county of Zutphen.’²³ About their dispersal around Zutphen, Busser continued: ‘I see them now in the towns *Hall, Eerbeek, Brummen, Voorst*, and in the townships *Tonden, Voorstonden, Euken, Empe*, etc.’. After observing local agricultural practices, Busser was convinced that the leafage of *Roomsche aardappelen* was good winter fodder. Furthermore, he requested readers who were in disbelief to witness the usage of potatoes in the area around Zutphen themselves. This showcases how local

²² Jonathan Busser, ‘Antwoord Op de Vraag, Des Oeconomischen Taks van de Hollandsche Maatschappye Der Weetenschappen, Te Haarlem, over Voeder Voor Het Rundvee, In Maart En April Groeijende Enz.’, in *Gedrukte Verhandelingen Landbouw 1780-1844*, vol. 1 (Haarlem: Jan van Walré, 1782).

²³ Busser, 6–7.

agricultural practice was not only a source of knowledge for intellectual discourse over potatoes, but also was crafted as an authority that could bolster one's argument.

Peasant cultivation practices could figure as authoritative sources since potato cultivation had increasingly been adopted in the Netherlands well before *Oeconomic* interest. Oliemans writes that the potatoes found their way to the Netherlands during the seventeenth century via the immigration of Huguenots from France, Protestants from the German Palatinate, and Mennonites from Switzerland.²⁴ These people had in common that they were prosecuted for their beliefs and found refuge in the Netherlands. While it is difficult to precisely pinpoint who brought potatoes to where, these migration waves overlap with the first written references to potatoes in the Netherlands and, moreover, these people came from areas where the potato had already been in cultivation. Oliemans therefore ascribes to what he call the 'immigration-theory' to explain the introduction of the potato in the Netherlands. Subsequently, periods of scarcity led people in the poorest regions in the Netherlands to also adopt potato cultivation. The famine of 1740, for example, caused an impulse to potato cultivation, as in the Beijerlanden, a marine clay district south of Rotterdam, only one farmer was documented to grow potatoes on a small plot of 0.65 ha in 1839, while nine farmers cultivated a total area of 13 ha in 1759.²⁵ This theory of local potato adoption explains not only how a novel crop travelled across Europe but also how knowledge of potato cultivation became an asset of people living on the margins of society.

The resultant dynamic between peasant farmers and elite reformers suggests that, indeed, 'peasant expertise in truth informed gentleman investigation', as Earle thinks was the case for France.²⁶ The dependence of the *Oeconomische tak* on local observation to acquire potato knowledge, as exemplified by Busser, explains why its impact on daily agricultural practices was marginal: in most cases, peasants were more knowledgeable about cultivation techniques than the reformers who hoped to educate them. Besides gentlemanly observation of local practices, the category of *landmannen* suggests the making of cultivator experimenters in this period. The *Oeconomische Tak* provided them with the opportunity to share their interest with similar-minded people. Therefore, I suggest that the society, most of all, provided a sphere of community-building for

²⁴ Willem H. Oliemans, *Het Brood van de Armen, de Geschiedenis van de Aardappel Temidden van Kettters, Kloosterlingen En Kerkuorsten* ('s-Gravenhage: SDU uitgeverij, 1988), 225–33.

²⁵ Bieleman, *Five Centuries of Farming*, 94.

²⁶ Earle, 'Promoting Potatoes in Eighteenth-Century Europe'.

reformers and cultivators, and, in doing so, crafted cultivator experimentation and peasants' farmer practices as valued sources of knowledge.

Petrus Joannes van Bavegem

The most extensive Dutch writing about potato cultivation at the end of the nineteenth century resulted from Flanders. Petrus Joannes van Bavegem wrote about the degeneration of the potato in a treatise called *Prijzverhandeling over de Ontaarding der Aardappelen*, published in 1782 in Dordrecht. The treatise was written as a response to a prize question from the Flemish learned society *De Keizerlijke en Koninklijke Academie van Konsten en Wetenschappen tot Brussel* that inquired into the nature of the by then increasingly prevalent potato disease named 'curl' and measures to take against it.²⁷

Just as in the Netherlands, this work concerned a treatise written in response to a prize question issued by a learned society. The treatise, however, was written by a recognized scientist. Karel Velle describes how Van Bavegem was important for the development of 'social medicine' and had demonstrated and advanced the caesarean section before he published about the potato.²⁸ While Dutch knowledge production about potato cultivation remained a domestic affair in this period, this Flemish treatise was received internationally. I will shortly discuss the treatise to highlight how international science-based inquiry into the potato contrasted the work by the correspondents of the *Oeconomische Tak* in the way it sought to construct expert authority. It provides another example of elite reliance on peasant cultivation knowledge, but, contrary to the correspondents in the Netherlands, this Flemish case disqualified farmer practices to convey credibility towards the investigation.

Van Bavegem's work was indebted to the writings of ancient and contemporary authors and the demonstration of cultivation practices by farmers. He drew upon descriptions from Roman authors, such as Plinius and Galenus, about the *Cyclamina*, a species resembling the current potato, and the seventeenth-century writings from the herbalist *Bauhinus*, with whom he agreed that the current potato is actually something different from the *Cyclamina*.²⁹ Furthermore, Van Bavegem referenced contemporary authors such as *Ludwig*, who was a member of the *Oeconomic* society in Saxen and the Palatine and had written about the nature, reproduction, and usage of

²⁷ Petrus J. van Bavegem, *Prijzverhandeling over de Ontaarding Der Aardappelen* (Dordrecht: A. Blussé&Zoon, 1782).

²⁸ Karel Velle, 'Petrus Joannes van Bavegem: Vlaams Grondlegger van de Sociale Geneeskunde', in *Er Is Leven Voor de Dood: Tweehonderd Jaar Gezondheidszorg in Vlaanderen* (Kapellen: Pelckmans, 1998), 102–4.

²⁹ Bavegem, *Prijzverhandeling over de Ontaarding Der Aardappelen*, 6–9.

the potato. Lastly, he referred regularly to peasant knowledge about potatoes. Most notably, Van Bavegem let farmers educate him in the determination of plants diseased by curl, because, as he wrote, ‘someone who didn’t have experience therein, could hardly know the difference’.³⁰ Being used to figuring in academic circles, Van Bavegem relied on a multitude of sources to bolster his research into curl.

Van Bavegem’s sources, however, were not valued equally. While ancient and contemporary authors were held in high regard, Van Bavegem constantly discredited peasant knowledge: ideas about curl from a woman potato farmer working for Van Bavegem’s family were ‘truly too ridiculous to be mentioned here’; and about the ideas of peasants concerning a possible relation between the time of day at which the potatoes were planted and the development of curl, he said that ‘such and many other chimere reflections, which find their origin only in superstition, would be all too ridiculous to be mentioned, since they could impossibly influence me.’³¹ Van Bavegem assumed expert authority not only by referencing ancient and contemporary authors but also by disqualifying farmer knowledge.

Contrary to correspondents from the *Oeconomische Tak*, Van Bavegem’s authority was thus not achieved by building upon, but by taking distance from farmer knowledge. This Flemish case is therefore not only indicative of the range of attitudes that existed towards peasant knowledge but also shows how a scientist could demarcate their work from layman theories. Its rhetoric prefigures professionalized science as emerged in the Netherlands only during the mid-nineteenth century as a response to the potato blight (chapter 3). I suggest that such denunciations of farmer knowledge were less likely to be found in the *Oeconomic* societal life of the Netherlands at the time since its community-building character aided the construction of farmers as sources for the constitution of expertise.

The *Oeconomic* state: agricultural statistics

Parallel to the citizen-driven project to acquire potato expertise, the Dutch state aimed to acquire agricultural expertise based on similar *Oeconomic* motivations as the *Oeconomische Tak*. In 1799, a year after the Netherlands turned into a centralised unitary state by the installation of the first Dutch constitution, Johannes Goldberg was appointed as *Agent van Nationale Oeconomie*. His job concerned the establishment of a governmental organ that would produce national statistics about commerce, industry, and agriculture. In 1805, inspired by the French *Sociétés d’Agriculture* and British Board of Agriculture,

³⁰ Bavegem, 35; 46–50.

³¹ Bavegem, 33–46; 45–46.

agricultural commissions were installed in every province of the Netherlands. Among the goals of the agricultural commissions were the consultation on national agricultural policy, the statistical examination of the region where they were located, the assurance of the quantity and quality of agricultural produce, the dispersal of useful seeds and crops, and the cultivation of new soils.³² The French period, however, disrupted the functioning of the commissions profoundly, and afterwards funding problems and decentralisation foreshadowed failure. Van der Poel highlights the institution of annual statistical reports about Dutch agriculture as one of the few achievements of the agricultural commissions.

John Lidwell-Durnin underscores the importance of investigating early nineteenth-century data infrastructures.³³ His investigation of early nineteenth century Great Britain shows how a state-initiative to gather data for the creation of an overview of the national agricultural produce did initially not yield consistent results. It did, however, reinforce the farmer conception that agricultural data only made sense in a framework of cultivation methods and disease occurrence. I will look into the Dutch annual agricultural reports to examine how expertise was constructed around quantitative data in the Netherlands. Being more focused on the regulation of trade than the application of science-based agricultural solutions, the Dutch government sought to acquire expertise about fundamentally different aspects of potato cultivation than the *Oeconomische Tak* did. Early efforts to create Dutch agricultural statistics show how data was recognized as an important means to inform national policy-making well before they started to play that role. Here, I examine the correspondence leading up to the publication of the national agricultural report of 1822, which is stored in the archives of the *Nederlandsche Maatschappij voor Nijverheid en Handel*.³⁴

Responses from 1822 to the questionnaires sent out to the agricultural commissions and other correspondents show that national agricultural statistics were, just as the British national agricultural statistics, marked by inconsistencies and shaped by local understandings of cultivation methods. The questionnaires included tables that asked for information about the state of various crops, different types of land, and several farm animals. More than 20 correspondents returned completed tables about the state of agriculture in their region. Only one of them, however, filled in the

³² Poel, 'Heren en boeren : een studie over de commissiën van landbouw, (1805-1851)', 83-84.

³³ Lidwell-Durnin, 'Cultivating Famine'.

³⁴ 'Landbouwkundige Berichten van de Departementen En de Ledencorrespondenten over 1822' (n.d.), 609.640, Noord-Hollands Archief, <https://hdl.handle.net/21.12102/A82FF538A51649B78930B4E7032BB96B>.

tables in a quantitative manner – P. Pont returned for each crop the amount of bags that were harvested for twelve different towns in the region *West-Friesland* (Figure 2). Most other correspondents wrote a few lines regarding the state of the potato. B. Rusburg, for example, wrote that ‘the potato crop grew reasonably well last year, although its cultivation still does not meet the needs’ and M.B. Martini, from ‘s Hertogenbosch, related the potato harvests to weather conditions – ‘the early cultivated potatoes have in these areas almost completely failed, burned by the drought, the later planted ones, however, have still resulted in a good crop, thanks to the soft rains in the month August’. Also, some correspondents described the potato harvest in relation to cultivation and storage techniques. The amount of information coming in from different correspondents could vary significantly – from Lochem and Deventer, the correspondent succinctly stated that the potatoes had known ‘a reasonably good harvest’. Completed tables reflect large freedom on the side of the correspondents to decide what data to provide, resulting in information that was different to reconcile in one agricultural report. Moreover, the written statements show how data on agricultural produce was embedded in a framework of cultivation methods and weather circumstances.

7) ERWTEN. ONDSCHIEDEN SOORTEN.	8) BOEKWEIT.	9) AARDAPPELEN.
Medemblik, ondersch. best 50 Zak		600 Zak
Oppevlied id 54		5490 id
Frisk		
Midd. & Oostvlied id 12		160 id
Sylbe: & Demingbeek		3000 id
Hoogr. & Noordvlied id 40		1000 id
Abbek. & Sombershang		2925 id
Obdam		60 id
Stentbeek		445 id
Spanbeek 4		1000 id
Opmeer		
St. Ilijan & Hauwert 10		1100 id

Figure 2: quantitative data about the potato harvest from the corresponding member P. Pont. The harvests are measured in the amount of bags.

The inconsistency of the information filled in by the correspondents is to a large extent explained by the disparate nature of Dutch agriculture itself. Van der Poel argues that exact numbers

were hard to get by at this time, as farmers often didn't know how the quantity of their harvest, nor the size of their lands, and standardized measures weren't adopted in agricultural communities.³⁵ More accurate overviews of agricultural output were possible, however, by looking at the market. The annual agricultural reports included detailed information about market prices of various crops and, from 1822 onwards, they contained a quantitative overview of the agricultural produce brought to the market in Leiden (Figure 3). Such data also had its limitations as there existed major differences between socio-economic systems in different regions in the Netherlands. Richard Paping and Vincent Tassenaar describe the nineteenth-century regional differences along a divide between coastal and inland provinces.³⁶ The coastal provinces were more urbanized and more market-oriented than the inland provinces, which were more directed at self-provision. The difficulty in creating national agricultural statistics due to the lack of standardization and the coastal-inland divide reflects how the Netherlands was still in the process of becoming a unified nation.

BIJLAGE C.

TIENJARIGE STAAT DER VOORTBRENGSELEN VAN DEN LANDBOUW,
op de publieke Markten te LEIDEN aangevoerd van 1824 – 1833.

Jaren.	TARWE.	ROGGE.	GARST.	HAYER.	BOONEN.		BOTER.	KAAS.	AARDAPPELEN.		AANMERKINGEN.
	Mudden.	Mudden.	Mudden.	Mudden.	DUIVEN.	PAARDEN.			VAOGE.	LATE.	
1824	1,257	3,330	3,356	3,685	"	"	313,500	110,016	12,855	22,411	
1825	1,149	4,816	4,636	4,951	"	"	405,772	106,671	13,557	31,033	
1826	735	4,838	4,821	6,177	"	"	376,520	93,159	11,479	31,414	
1827	569	4,720	4,272	5,350	"	"	441,870	80,836	12,580	29,835	
1828	942	4,948	4,345	7,810	1,556	1,413	443,470	93,236	15,823	32,365	
1829	822	5,249	4,582	6,506	1,239	1,297	422,000	86,237	15,400	36,900	
1830	775	5,109	3,773	8,483	1,017	1,489	339,829	59,241	16,500	33,500	
1831	715	4,423	3,701	7,690	1,005	1,298	375,620	65,991	16,050	36,900	
1832	988	4,432	4,477	7,565	1,093	1,102	380,510	72,795	14,000	35,760	
1833	1,582	5,553	3,924	8,146	1,574	1,248	402,800	71,612	13,900	36,250	
Totaal	9,534	47,418	41,687	66,363	7,454	7,947	3,901,911	840,694	141,084	326,368	
Gemidd.	953½	4,741½	4,168½	6,636½	1,242½	1,321½	390,191½	84,069½	14,108½	32,636½	

Figure 3: Overview of the agricultural produce brought to the market of Leiden from 1824 until 1833. Records start originally from the year 1822.

The tendency to deliver qualitative information, such as perceived potato shortages and relations between weather and potato harvests, indicates a bottom-up influence of farmer conceptions of agriculture in early nineteenth-century Dutch data-gathering projects, as Lidwell-Durnin suggests for Great Britain. As a result, the nature of

³⁵ Poel, 'Heren en boeren : een studie over de commissiën van landbouw, (1805-1851)'.

³⁶ Paping and Tassenaar, '8. The Consequences of the Potato Disease in the Netherlands 1845-1860'.

the data provided made it more useful for cultivators to adapt cultivation practices than for national policymaking to manage trade. In fact, the knowledge accumulated in the national agricultural reports fitted the goals of the *Oeconomische Tak* better than the number-hunger of the Dutch government, as correspondents regularly made mention of experiments with potato cultivation. This explains why after 1828, the publication of the reports was no longer a responsibility of the Dutch state, but of committees of the societies *Nederlandsche Huishoudelijke Maatschappij* and *Maatschappij van Nijverheid* respectively, which were both descendants of the *Oeconomische Tak*. Only in 1851 did the Dutch government again become involved in the publication of the agricultural reports by commissioning Jan Wttewaal as editor. Interestingly, from 1828 until 1850, the reports thus served to inform a group of upper and middle-class citizens about the state of Dutch agriculture without any direct implications for state governance, and potato expertise became solely directed at individual action.

Philanthropic potatoes

The Friesian Society for Experimental Agriculture

In the 1830s, a second wave of agricultural reformation, borne out of dissatisfaction with the functioning of the agricultural commissions, rolled over the Netherlands. This time, emerging agricultural communities were marked by an ideology of philanthropy and more focussed at the improvement of agriculture locally. A notable example is the Friesian Society for Experimental Agriculture, founded by doctor Julius Vitringa Coulon in 1834. The society came forth out of Coulon's desire to improve the wealth of the province and thereby resonates with the *Oeconomic* project. Initially, 120 people, eminent landowners and farmers, signed up as member.³⁷ The society was primarily concerned with the production of butter, sheep-keeping, and potato cultivation. For their communication, the members depended heavily on the *Leeuwarder courant*, where they announced upcoming meetings and reported on their activities. The society provides an interesting case study for it embarked with learned societies such as the *Oeconomische Tak* as a template, but, over the course of its lifetime, reinvented its purpose into the provision of social-economical services to farmers. I will trace this development to see how the

³⁷ Mengelwerk. Vriesch genootschap van proefondervindelijke landbouw. "Leeuwarder courant". Leeuwarden, 25-03-1834, p. 1. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582144:mpeg21:p001>; Coulon J. Vitringa, 'Plan Om in Vriesland Een Genootschap van Proefondervindelijke Landbouw Op Te Rigten.', 22 January 1834.

constitution of potato expertise became entangled with issues of potato quality insurance in the local provincial setting of Friesland.

The society's focus on doing experiments shows a strong continuation with Enlightened learned societies such as the *Oeconomische Tak*. This practice was borne, first, out of the belief that agriculture would benefit from scientifically produced knowledge and, second, out of the realisation that most farmers and landowners did not have the means to do experiments themselves. The experiments partly took place on a piece of land acquired by the society and partly by members at their own expense.³⁸ Regarding potatoes, the society investigated what size of seed potato yielded the most, which potato variety was most suitable to be cultivated in Friesland, and which measures worked best in preventing potatoes from getting curled – the same question posed by Van Bavegem almost 50 years earlier. In October 1834, the resultant harvests from cultivating different potato varieties were investigated and tasted during a lunch meeting.³⁹ Furthermore, findings were discussed regularly within the society and published in the journal *De Vriend des Vrieschen Landman*, which saw two editions, one in 1835 and one in 1836. The traditional practices of learned societies – experimentation and the publication of research findings – were, however, quickly sidetracked when the Friesian Society for Experimental Agriculture became concerned with potato quality insurance.

Due to its local character and farmer representation, the society looked for ways to aid potato cultivators in different ways than creating and distributing knowledge. The first edition of the *De Vriend des Vrieschen Landman* shows, for example, that the society took action to safeguard the identity of one of its most valued potato varieties, the *Vriesche aardappel*.⁴⁰ This potato variety was mostly exported to Amsterdam and the province of Holland and was therefore recognized as an important source of wealth for Friesland. However, due to the favourable prices at which this variety could be sold, arable lands less suitable for potato cultivation had been increasingly planted with the *Vriesche* potato and the stocks that were exported had become mixed with other potato varieties that were better used as fodder than as human food. Therefore, the quality and reputation of the *Vriesche* potato was dwindling. In response, the society took action to set up an

³⁸ Mengelwerk. Vriesch genootschap van proefondervindelijken landbouw. "Leeuwarder courant". Leeuwarden, 20-05-1834, p. 2. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582160:mpeg21:p002>.

³⁹ Het Vriesch genootschap van proefondervindelijken landbouw. "Leeuwarder courant". Leeuwarden, 28-10-1834, p. 3. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582206:mpeg21:p003>

⁴⁰ *De Vriend Des Vrieschen Landman* (Van den Bosch, 1835).

inspection system to safeguard the quality of *Vriesche* potatoes that were to be exported.

Another initiative by the society to improve potato cultivation in Friesland was the distribution of a new promising winter variety of potatoes. In the *Leeuwarder courant* of 28 February 1837, farmers interested in seed potatoes of this variety were asked to address the secretary of the society to ensure the ‘rapid dispersion of this excellent winter potato’.⁴¹ In 1839, the society again announced in the *Leeuwarder courant* that farmers could receive seed potatoes from the society.⁴² These initiatives show that, besides doing experiments, the maintenance of Friesian potatoes as a high-quality crop became a valued means to improve local agriculture. While the scientific activities of the society mostly came to an end when Coulon stepped back as chairman of the society two years after its founding in 1836, the society continued to provide non-scientific services, such as the distribution of potatoes, to the agricultural community until 1840.

For the society, the mingling of people of different backgrounds not only made science a collaborative effort, but also put science in the context of local trade and quality insurance, as farmers and landowners often had other interests besides the production of knowledge about cultivation techniques. Notably, in the final years of the society, its main concern was the installation of an insurance fund for the loss of cattle and horses.⁴³ Coulon, however, seems to have regretted the way to society slowly lost interest in experimentation, as he fully distanced himself from it in 1837.⁴⁴ While I believe the non-scientific activities of the Friesian Society for Experimental Agriculture indicate a greater awareness of the daily reality of farmers than could be seen in the earlier discussed examples of the *Oeconomische Tak* and Van Bavegem, the integration of science and agriculture, now based on an ideology of philanthropy, remained a difficult enterprise.

Julius Vitringa Coulon as civil scientist

Coulon’s engagement in local societal life is typical behaviour of scientists operating at this time and sharply contrasts with scientists investigating the potato blight in later years (chapter 3). I believe his

⁴¹ "Leeuwarder courant". Leeuwarden, 28-02-1837, p. 3. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582449:mpeg21:p003>

⁴² "Leeuwarder courant". Leeuwarden, 01-03-1839, p. 2. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582655:mpeg21:p002>

⁴³ Reglement, ter onderlinge verzekering van rundvee en paarden in de provincie Vriesland, behorende deze instelling bij het Vriesch genootschap voor proefondervindelijke landbouw. "Leeuwarder courant". Leeuwarden, 31-01-1840, p. 5. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582750:mpeg21:p005>

⁴⁴ "Leeuwarder courant". Leeuwarden, 22-08-1837, p. 3. Geraadpleegd op Delpher op 25-04-2024, <https://resolver.kb.nl/resolve?urn=ddd:010582499:mpeg21:p003>

role within the Friesian community is emblematic of what Ad Maas coins the ‘civil scientist’.⁴⁵ Maas argues that the civil scientist practised science amidst a citizen culture of lively intellectual interest that made science a collective enterprise. The civil scientist is furthermore characterized by a remarkably outward-oriented attitude and a lack of a clear separation between professional and private life. As a strong national impulse to orchestrate the scientific community was lacking, civil scientists mostly focused their efforts locally. Coulon, who did not aim to tackle issues surrounding potato cultivation through individual scientific investigation, but, instead, hoped to engage local society in the making of knowledge, fits the character of the civil scientist closely. His attitude to scientific investigation not only contrasts that of later Dutch scientists but also Van Bavegem’s, who figured prominently in academic circles and counterargued farmer knowledge. As such, Coulon, and not Van Bavegem, became directly confronted with the socio-economic reality of farming. While the society’s farmer representation led to the installation of useful community services, such as the distribution of potato varieties, the decreasing focus on experimentation suggests that later Dutch scientists investigating the potato blight had their reasons to practice research more isolated from society.

Conclusion

In this chapter, I have shown how potato expertise in the period preceding the potato blight was constituted in three different distinct settings. First, the learned society the *Oeconomische Tak* sought to constitute expertise to provide science-based solutions to the agricultural community. Their modus operandi of issuing prize questions about topics that had caught their attention led to the accumulation of several treatises that inquired into different aspects of potato cultivation. While a systematic approach to constituting potato expertise was lacking, this method enabled a category of *landmannen* to submit their findings and theories to a larger audience. Moreover, local gentlemanly investigation, exemplified by Jonathan Busser, channelled farmer potato knowledge in a bottom-up manner. Although the *Oeconomische Tak* aimed to transform local industries by educating peasants, constituting expertise was for the society mostly a way to gather socially around similar interests and enrich its understanding of Dutch agriculture. Since the society’s efforts hardly affected daily agricultural practices, I argue that the *Oeconomische Tak* figured primarily to build a community of elite agricultural reformers, who, in their doings, crafted cultivator experimentation

⁴⁵ Maas, ‘Civil Scientists’.

and locally observed farmer practices as authoritative sources of knowledge.

Second, the Dutch state, based on a similar *Oeconomic* ideology as the *Oeconomische Tak*, sought to constitute expertise over different aspects of potato cultivation and in a different manner. Aiming to inform national policymaking with statistical information about Dutch agriculture, agricultural commissions throughout the Netherlands were set up to act as a corresponding network. Yearly, the commissions filed information in questionnaires that were compiled in national agricultural reports. The correspondence leading up to the national agricultural report of 1822 shows that correspondents could decide for themselves what kind of data to provide about the potato cultivation in their region, with responses ranging from quantitative to qualitative indications, and from very succinct to contextualized statements. The inconsistency of the data provided is at least partly explained by the disparate nature of Dutch agriculture at the time. While the reports remained shelved for matters of national policymaking due to the lack of quantitative statistics, I argue that the qualitative nature of the data, contextualized by cultivation practices and weather circumstances, made it suitable for cultivators to adapt cultivation practices. The fact that the responsibility of making of the national agricultural reports was transferred from the state to societies descendent from the *Oeconomische Tak* suggests that, indeed, their content became mainly directed at informing cultivator practice. As such, Lidwell-Durnin's analysis of data-gathering infrastructures in Great Britain matches by findings for the Netherlands. In the following chapters, however, I will challenge Lidwell-Durnin's claim that such expertise lost its functionality in the face of the potato blight.

Third, in the local provincial setting of Friesland, during the second wave of agricultural reformation starting in the 1830s, the constitution of expertise became entangled with matters of potato quality insurance that provided socio-economic security to the agricultural community. Embarking with the ambition to set up cultivation experiments, the Friesian Society for Experimental Agriculture was modelled upon more prominent learned societies such as the *Oeconomische Tak*. Due to its local character, however, farmer representation improved, so that other agricultural issues reached the agenda of the society. The effort to set up an inspection system to safeguard the *Vriesche* potato, a potato variety linked to the identity of the province through its name, and the distribution of promising new potato varieties highlight the importance perceived within the society to manage local trade and improve the wealth of the province. I argue that the society's founder, Julius Vitringa Coulon, is best characterized by Maas's notion of the 'civil scientist', as he was very socially engaged

and attained a role to morally guide local society by his status as an expert.

What unifies the different forms of potato expertise discussed in this chapter is their communal character. As such, my analysis of expertise contrasts that of Earle and Spary. Contrary to France, which saw the emergence of individual potato experts such as Parmentier, potato expertise in the Netherlands did not acquire an individual character in the Enlightenment period. Also, while in France the potato expertise was crafted around the potato as a Republican symbol for renewal during the revolution, potato expertise in the Netherlands was embedded in an *Oeconomic* ideology that addressed agricultural reformation more generally. Similar to Earle, however, I argue that, as for gentleman investigation in France, community-driven potato research in the Netherlands was informed by peasant cultivation methods. While farmers were not explicitly crafted as experts, their practices were figured as authoritative sources of knowledge within agricultural-minded societies. The progression from a national to a local focus of agricultural reformation as seen in this chapter suggests that the communal character of expertise was reshaped over the years. The usage of the newspaper by the Friesian Society for Experimental Agricultural as a platform for communication hints at the way this emerging medium transformed expertise constitution in later years, as discussed in the following chapter.

2 Potatoes in the News

The potato blight changed the publication landscape surrounding the potato drastically, as the resultant wave of literature is best characterized as a publication boom. Instances of the potato blight in the Netherlands were first noticed at the end of July 1845 and newspapers were the first to spread the message. On July 25th, the *Utrechtse provinciale en stads-courant* wrote that the potato crop had turned black in 's Hertogenbosch, while it had been flourishing a few days earlier.⁴⁶ Another observation of potato blight was made in the *Bommelerwaard* and reported in the *Provinciale Geldersche en Nijmeegsche courant*; the disease was described as sickening the potato plant over one night, resulting in hanging, rotten, and dead leaves the morning after.⁴⁷ In more and more places in the Netherlands, black-coloured leafage and the stench of rot announced a failed harvest, until the potato cultivation was affected nationwide. As emerging regional and national public spaces, Dutch newspapers were essential in conveying the scope and impact of the potato blight. Therefore, I will examine in this chapter how Dutch newspapers functioned as platforms for the constitution of expertise by exchanging knowledge about the potato blight.

Newspapers have been recognized as one of the driving forces behind the modernization of the Netherlands.⁴⁸ Over the nineteenth century, the circulation of newspapers continuously expanded and the Dutch population became increasingly receptive to written news as literacy increased steadily. Moreover, the character of newspapers gradually changed from a platform to announce state and family matters informatively to a space that shaped political and public opinion.⁴⁹ The *Algemeen Handelsblad* manifested itself from 1828 onwards as the new model for Dutch newspapers, whose ambition to publish actually and truthfully reflected a liberal attitude. At the same time, other newspapers started to deliver commentary on national policy: in 's Hertogenbosch the *Noord-Brabander* started to defend the Catholics' interests, while the *Arnhemsche courant* ventured to also provide liberal commentary. After the liberal constitution of 1848,

⁴⁶ Utrechtse provinciale en stads-courant, Nederland, 25-7-1845, <https://resolver.kb.nl/resolve?urn=ddd:010779286:mpeg21:p002>.

⁴⁷ Provinciale Geldersche en Nijmeegsche courant, Binnenlandsche Berigten, 26-7-1845, <https://resolver.kb.nl/resolve?urn=MMKB19:000665060:mpeg21:p00002>.

⁴⁸ D. Van Lente, 'Papier, Druk En Communicatie', in *Geschiedenis van de Techniek in Nederland. De Wordings van Een Moderne Samenleving 1800-1890. Deel II. Gezondheid En Openbare Hygiëne. Waterstaat En Infrastructuur. Papier, Druk En Communicatie.*, ed. H.W. Lintsen et al. (Zutphen: Walburg Press, 1993).

⁴⁹ R. Aerts, 'De Koningin Geknecht, 1813-1869', in *De Krant: Een Cultuurgeschiedenis*, by Huub Wijffjes and Frank Harbers (Amsterdam: Boom, 2019), 87-119, 299-302.

Dutch newspapers took on a more defined political signature and functioned increasingly as the centres for political group formation. Rapidly developing a more pronounced political function during the time of the potato blight, mid-nineteenth-century newspapers provide an exciting opportunity to explore the political dimension of potato knowledge.

Previous research leaves a great deal to be discovered about the Dutch press response to the potato blight and the role of Dutch newspapers as platforms for expertise constitution. Bergman argues that Dutch newspapers, just like the Belgian, remained mostly silent about the potentially disastrous consequences of failing potato harvests.⁵⁰ Arthur Vermeersch's study of the Flemish press response gives more context to the meaning of this silence in newspapers. Vermeersch writes that the Flemish press chose voluntary censorship over opinionated news to comment on such a complex issue as famine.⁵¹ The attitude of the press was aimed at maintaining national stability and extensively reporting about unrest or hunger was deemed undesirable. Only in the winter of 1847, when the misery was largest and people started to riot, did newspapers pose questions like: 'What will the people eat?' and 'Will the people be able to eat?'.⁵² Any solution-oriented approach towards the famine, however, quickly made way for the search for a political scapegoat, as, in the Flemish elections of 1847, the conservative candidate was accused of wanting to starve the people.⁵³ All in all, Vermeersch's depiction of the Belgium press response to the famine following the potato blight suggests that newspaper coverage was geared towards an elite audience that was mostly occupied by their political interests. According to the Bergman, most Dutch newspapers followed the Belgian pattern, although some newspapers such as the *Groninger courant* did report more actually about the seriousness of the situation than others.

Richard van Tilburg, in an analysis of the societal discourse about the nutritional value of potatoes that followed the potato blight, sketches succinctly the relationship between Dutch newspapers and science.⁵⁴ Tilburg notes how the *Algemeen Handelsblad* functioned as a platform for science-informed opinion. For example, opinion pieces about negative health effects of potatoes related the nutritional value

⁵⁰ M. Bergman, 'The Potato Blight in the Netherlands and Its Social Consequences (1845–1847)', *International Review of Social History* 12, no. 3 (December 1967): 401, <https://doi.org/10.1017/S0020859000003424>.

⁵¹ A. Vermeersch, 'De Pers En Het Pauperisme in Vlaanderen', *Bijdragen Voor de Geschiedenis Der Nederlanden* 13 (1959): 85.

⁵² Vermeersch, 95.

⁵³ Vermeersch, 98.

⁵⁴ Richard van Tilburg, "'Divine Food' or the 'Worst Known Foodstuff'? Religion, Nutrition and Society in Dutch Potato Discourse (1840-1860)", *Leidschrift* 34 (2019): 71–87.

of food closely to its chemical composition, arguing that the potato to be insufficient to fulfil one's basic need for protein. This stance was informed by the views of the nutritional scientists Mulder, Donders, and Moleschott, which were expressed in Mulder's book *De Voeding in Nederland, in Verband tot den Volksgeest* (1847). A more local and urban newspaper, the *Leydsche courant*, on the contrary, held a positive attitude towards potatoes, which is explained by the different audience addressed by the newspaper compared to the *Algemeen Handelsblad*. The guidelines for the consumption of rotten potatoes, which were published regularly in the newspaper, suggest, according to Tilburg, that potato consumption was a vital part of the daily reality of its readership. While Bergman and Tilburg touch upon the discourse in Dutch newspapers surrounding the potato blight, their contributions are concise and based on small amounts of newspaper data. I aim to provide a more systematic study of the Dutch press response.

In this chapter, I want to add a new perspective to mid-nineteenth-century newspapers as emergent public spaces by asking how expertise about the potato blight was constituted and contested in them. Given the quantity of data available (31 980 newspaper articles), I opted for a Digital Humanities approach, which I lay out in the methodology section after discussing the data used for my study. Following, I will first examine the temporal and spatial dimensions of the newspaper coverage of the potato blight to see whether newspaper coverage was season-dependent and which newspapers published most regularly about the disease. Second, I will look into the content of the newspaper articles that published about the potato blight to probe the type of knowledge that acquired a platform in newspapers. Third and last, I will analyse the scientific connotation of *aardappel* to observe general trends of the role of scientific and statistical investigation in constituting potato expertise in newspapers.

My results indicate that a multitude of potato blight reports were published, of which many understood disease occurrence within a cultivator's frame of reference. In that sense, newspaper articles covered similar potato knowledge as the national agricultural reports discussed in the previous chapter. Its constitution, however, was less systematic and more anonymous compared to the correspondence networks upon which the reports were built. I argue that, within this abundance of newspaper articles, potato expertise was dynamically built upon the contributions of many local observations, which stood in dialogue with several more exhaustive scientific accounts, and that, besides scientific explanation, testimony was the dominant means of acquiring expert knowledge.

The data

The sources I used for this chapter are the Dutch nineteenth century newspapers available in the Delpher open newspaper archive.⁵⁵ A temporal overview of the number of articles that mention ‘*aardappel**’ from 1813 until 1869 shows that these articles more than tripled in frequency from the period before the blight to the first three years in which the blight occurred (Figure 4). At its peak, the amount of articles talking about potatoes was close to 4.5 percent of the total amount of newspapers available in the Delpher database. Afterwards, the amount of newspapers mentioning ‘*aardappel**’ plateaued at around 2.2 per cent of the total until 1856, after which the percentage decreased further. I believe this trend to be indicative of an increased interest in the potato blight in newspapers from 1845 until 1856 and have therefore taken the newspapers published in this period as the focus of my investigation. Given that the absolute amount of newspaper articles in this period is 31,890, I opted to combine a Digital Humanities method with the close reading of newspaper articles.

I want to briefly touch upon biases present in the newspaper database I used. It should be noted that by using a Digital Humanities approach more well-known and therefore digitized newspapers are prioritized over more specialised or local, and therefore undigitized, newspapers. The tendency to prioritize the digitization of historically popular newspapers has at least resulted in a mismatch between the database I used for quantitative analysis and the database I used to query for newspaper articles. While the online version of the Delpher database that was used for querying is up-to-date, the downloadable version of the open newspaper archive that was used for quantitative analysis was last updated in 2019. Newspaper titles digitized after 2019 include, among others, the *Landbouw-courant* and the *Nijverheids-courant*.⁵⁶ While I don’t think this poses a problem for my methodology, it is good to take notice of the fact that there exist important digitized sources that are left out from the data used for my quantitative research and that there are still undigitized newspapers out there.

⁵⁵ ‘Delpher Open Krantenarchief’ (KB, 2019), <https://www.delpher.nl/over-delpher/delpher-open-krantenarchief#69140>.

⁵⁶ ‘Nieuwe Kranten in Delpher (1632-1950)’, 21 January 2021, <https://www.metamorfoze.nl/nieuws-agenda/nieuwe-kranten-delpher-1632-1950>.

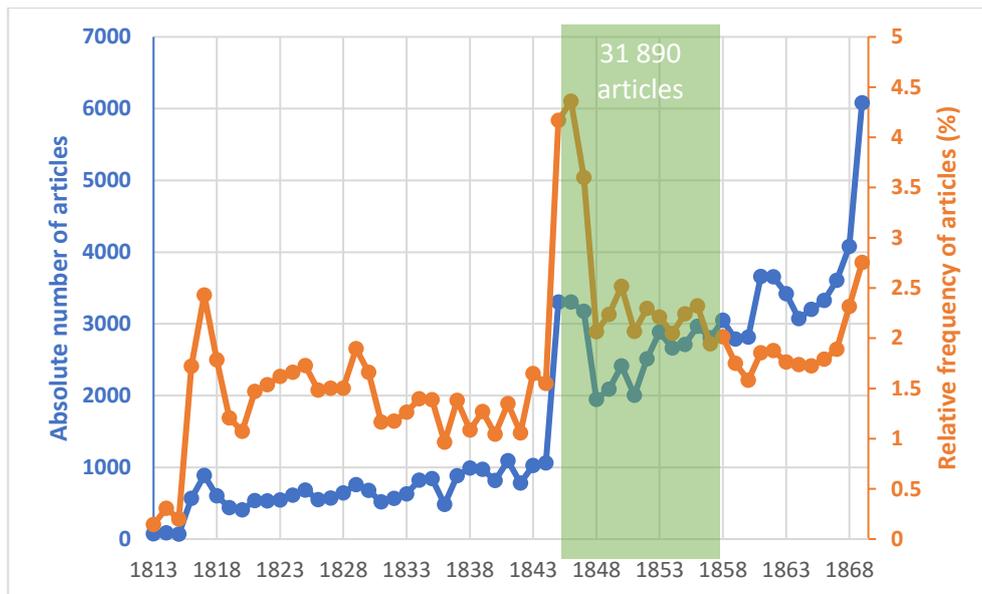


Figure 4: Temporal overview of the absolute number of articles (in blue on the left axis) and the relative frequency of articles (%) (in orange on the right axis) that mention ‘aardappel*’, from 1813 until 1869. The period in which the relative frequency of ‘aardappel*’ is thought to be elevated due to the potato blight is marked in green, this period comprises 31 890 articles.

Methodology

This section describes in detail how the results discussed in the following sections were obtained. It goes over the use of wordcounts for mapping the temporal and spatial dimensions of newspaper coverage of the potato blight and the construction of word embeddings for a content analysis of the newspaper database, delving into their application for keyword-based archival research and mapping the temporal change of the scientific connotation of *aardappel* over the nineteenth century. I believe the amount of detail provided is important to ensure the reproducibility of my study, while also explaining the choices I made in my research process. Readers less interested in the specifics of my Digital Humanities methodology are invited to skim over or skip to the next section.

To analyse newspapers as a platform for the constitution of expertise, I first looked at the temporal and spatial distribution of newspaper articles that mentioned the potato blight. By looking at temporal distribution, I wanted to see to what extent newspaper coverage of the potato blight was season-dependent. I thus used word counts to look at monthly variations of the occurrence of *aardappelziekte*. *Aardappelziekte* first appeared about ten days after the disease was first reported in the *Utrechtse provinciale en stadscourant* and has been the common way of referring to the potato blight

up to this moment.⁵⁷ By analysing the spatial dimension of the press coverage of the potato blight, I wanted to observe differences between potato talk on a local level and a national level. To this end, I compared the frequency of *aardappelziekte* in the national newspapers *Nieuwe Rotterdamsche courant*, *Algemeen Handelsblad*, and *Nederlandsche staatscourant*; the provincial newspapers *Drentsche courant*, *Provinciale Overijsselsche en Zwolsche courant*, *De Noord-Brabander*, and *Utrechtsche provinciale en stadscourant*; and the urban newspapers *Bredasche courant*, *Groninger courant*, *Arnhemsche courant*, *Leeuwarder courant*, *Leydsche courant*, and *Opregte Haarlemsche Courant*. It should be noted that some provincial and urban newspapers were more widely read than their name would suggest, the *Groninger courant*, for example, was targeted also at the region surrounding the city of Groningen and the *Arnhemsche courant* even had a national readership. For both the construction of the temporal and the spatial overview of the newspaper data the tools available in I-Analyzer were used.⁵⁸ The temporal and spatial dimensions of the press coverage provided an insightful overview of the newspaper articles at hand before looking closer into their content.

To answer my most urgent question concerning the newspaper articles – What knowledge about potatoes was shared in newspapers during the potato blight? – I constructed word embeddings and used cosine similarity values to find keywords relating to *aardappelziekte* (see the theory box for an explanation of the concepts of word embedding and cosine similarity value). The keywords were essential in querying the online Delpher database more focused. Before going into the way I used cosine similarity values to select the keywords, I

⁵⁷ The oldest newspaper mentioning ‘*aardappelziekte*’ according to a search in Delpher: “Drentsche courant”. Assen, 05-08-1845, p. 2. Geraadpleegd op Delpher op 21-03-2024, <https://resolver.kb.nl/resolve?urn=ddd:010786424:mpeg21:p002>.

⁵⁸ I-Analyzer can be used to explore corpora and is developed by Utrecht University’s centre for Digital Humanities by the Research Software Lab.

will now first describe how the word embeddings were constructed. The code I wrote and used in the process can be found on GitHub.⁵⁹

Theory

Word embeddings

Recently, word embeddings have increasingly received attention from historians as a means to capture semantic information from large corpora of text. Word embeddings are constructed by models that learn about the relationship between words by analysing their distribution within a corpus; words that often occur in syntactically similar contexts are embedded similarly by the model. The semantic information carried by word embeddings can be used for synonym detection, concept categorization, estimating semantic relatedness, and inferring analogous concept relations. Historians have used word embeddings to track the semantic change of concepts or map the discursive space of specific words of interest. A quantitative overview of the discursive space of a word of interest can guide the construction of queries in subsequent qualitative research.

Cosine similarity value

Word2Vec constructs word embeddings as vectors in a vector space with a fixed dimensionality. A useful feature of this method is that the distance between vectors in such a vector space is related to semantic information: the smaller the distance between two vectors, the higher the semantic similarity between the two words represented by the vectors. Taking the cosine between two vectors is the common method for calculating the distance between vectors and yields what is known as the cosine similarity value. 1 is the highest possible cosine similarity value and indicates the highest semantic similarity between two words, while -1 is the lowest possible cosine similarity value and indicates the lowest semantic similarity between two words.

I trained word embeddings based on newspaper data dating from 1815 until 1879 available in the public newspaper database of Delpher. After downloading and unzipping the files, I collected the metadata in an Excel file. The metadata was used to filter the newspapers for date, language, and publication type (i.e., article, advertisement, or family announcement). Before modelling the word embeddings, the data was pre-filtered and pre-processed. I pre-

⁵⁹ The GitHub Repository: <https://github.com/ThijsTub/word-embeddings-for-nineteenth-century-Dutch-newspapers>.

processed the data in chunks of one year, and only those texts that were labelled as ‘Dutch’ and ‘article’. Pre-processing consisted of tokenising the text, segmenting the text into sentences, making all tokens lowercase, eliminating tokens up to three and longer than fifteen characters, eliminating stop words, and eliminating sentences that contained more than 30 per cent misspelt words, which were identified by using a list of historic Dutch words.⁶⁰ The spelling check was especially important as the historic data I used was created using OCR and therefore contained many misspelt words. Using the pre-processed data, I created ten different sets of word embeddings for ten different timeframes using the Word2Vec implementation of Gensim.⁶¹ Word2Vec was run with default settings, except for dimensionality, which was set to 300. The timeframes were chosen based on the amount of newspaper data available, which steadily increases over the nineteenth century, and the aim to create a somewhat fine-grained depiction of temporal semantic change of words of interest. Therefore, I split the period preceding the year the potato blight first occurred (1845) into three timeframes of ten years and the period from 1845 onwards into seven timeframes of five years (Table 1). While for none of the timeframes the amount of tokens reached the desired minimum of 100 million, I believe that the following application of the word embeddings has proven their usefulness for the heuristic ends of this study.⁶²

⁶⁰ SpaCy was used for tokenizing and sentencizing the data. I learned to use spaCy thanks to the following sources: Megan S. Kane, ‘Corpus Analysis with spaCy’, ed. John R. Ladd, *Programming Historian*, no. 12 (2 November 2023), <https://doi.org/10.46430/phen0113>; *Natural Language Processing with spaCy & Python - Course for Beginners* (YouTube, 2021), <https://www.youtube.com/watch?v=dIUTsFT2MeQ>. The method of pre-processing was loosely based on the method applied by Melvin Wevers (2019). An important difference is how the spelling check was performed. While Wevers removed misspelt words, I removed sentences that contained more than 30 per cent of misspelt words. As the modelling algorithm used in both cases, Gensim’s Word2Vec, processes text by sentences and depends on the distribution of words within such a sentence, I believe that removing misspelt but relevant words from sentences disturbs how the algorithm interprets the relation between the remaining words in such sentences and, thus, that removing entire sentences with a high rate of misspelling is preferred. Melvin Wevers, ‘Using Word Embeddings to Examine Gender Bias in Dutch Newspapers, 1950-1990’ (arXiv, 21 July 2019), <http://arxiv.org/abs/1907.08922>. The list of historic Dutch words was taken from the Dutch Language Institute: ‘INT Historische Woordenlijst’ (Dutch Language Institute, 2012), <http://hdl.handle.net/10032/tm-a2-a6>.

⁶¹ The documentation of the Word2Vec implementation of Gensim guided me throughout the modelling process: Radim Řehůřek, ‘Word2Vec Model’ (Gensim, topic modelling for humans, 21 December 2022), https://radimrehurek.com/gensim/auto_examples/tutorials/run_word2vec.html#sphx-glr-auto-examples-tutorials-run-word2vec-py.

⁶² Melvin Wevers and Marijn Koolen, ‘Digital Begriffsgeschichte: Tracing Semantic Change Using Word Embeddings’, *Historical Methods: A Journal of Quantitative*

Table 1: The timeframes and the related amount of tokens used to construct word embeddings

Timeframe	# tokens
1815-24	13 279 740
1825-34	32 864 014
1835-44	52 302 426
1845-49	42 017 351
1850-54	50 866 060
1855-59	58 715 665
1860-64	70 567 166
1865-69	74 565 178
1870-74	55 885 941
1875-79	77 204 011

Using the word embeddings, I looked for keywords that could aid my archival research by building queries including the keywords. Keywords were identified based on both quantitative analysis and my personal interpretation. First, I selected words that had a cosine similarity value with *aardappelziekte* of 0.50 or higher. This threshold cosine similarity value was somewhat arbitrarily chosen, but it gives a manageable amount of results and lies close to 0.45 as used by Joris van Eijnatten and Pim Huijen in their cosine similarity study.⁶³ Second, out of the words selected, I picked words that seemed relevant to my research. This meant that words that described different diseases than the potato blight and words that related to the cultivation of other crops than potatoes were discarded, together with words that were highly synonymous to *ziekte*, *aardappelziekte*, or *aardappel*. Third, the final selection of keywords was made by checking whether the cosine similarity value of the words that fulfilled the first two criteria was positively related to the occurrence of the potato blight. To this end, I analysed the temporal changes of the cosine similarity values of the selected words with *aardappel** and looked for an increase from the years before the potato blight (1835-44) to the years during the potato blight (1845-49). Only words that fulfilled all three criteria were selected as keywords and used in subsequent querying of the online Delpher newspaper archive.

To explore the usage of the keywords and examine their importance in conveying knowledge about the potato during the potato blight, I built queries with each keyword and *aardappelziekte*

and Interdisciplinary History 53, no. 4 (1 October 2020): 233, <https://doi.org/10.1080/01615440.2020.1760157>.

⁶³ Joris Van Eijnatten and Pim Huijen, 'Something Happened to the Future: Reconstructing Temporalities in Dutch Parliamentary Debate, 1814–2018', *Contributions to the History of Concepts* 16, no. 2 (1 December 2021): 72–73, <https://doi.org/10.3167/choc.2021.160204>.

and collected 5 use cases within the period under investigation (1845-56).⁶⁴ The use cases were selected based on the highest relevancy, a sorting option by Delpher based on the relative frequency of the search term in an article. The use cases were examined by close reading, resulting in an overview of the content of the articles addressing the potato blight.

Lastly, in addition to the open-ended method of using word embeddings to find keywords relating to the potato blight, I used the constructed word embeddings to analyse the temporal changes of the connotation of *aardappel** more targeted. I wanted to question specifically to what extent potato expertise in newspapers was dependent on scientific and statistical investigation during the potato blight. To find that out, I plotted the temporal change of the cosine similarity values of *wetenschap* and *statistiek* with *aardappel** and added the cosine similarity of *landbouw* with *aardappel** as a reference.⁶⁵ I understood an increased cosine similarity between science and statistics and potato as an indicator that potato talk in newspapers was increasingly backed by scientific and statistical investigation, while a decreased cosine similarity would indicate the opposite.

Actual and provincial news

The temporal and spatial dimensions of newspaper articles mentioning the potato blight is a good starting point are a good starting point for investigating how expertise was constituted in newspapers. By looking at the monthly variation of the usage of *aardappelziekte*, I ask whether news coverage about the disease was season-dependent, which indicates the events articles about the potato blight were related to – occurrences of the disease itself or famine. By looking at the frequency of *aardappelziekte* in different newspapers, I ask at which scale the potato blight was most intensely discussed – urbanely, provincially, or nationally. The results suggest that newspapers provided a platform for potato knowledge that was highly dynamic, both temporally and geographically. Thereby, newspapers stand in sharp contrast to the national agricultural reports discussed in the previous chapter, which sought to constitute expertise systematically through a prefigured correspondence network of agricultural commissions.

⁶⁴ Another useful feature of the keywords is the possibility to find newspaper articles about the potato blight without using *aardappelziekte* as part of the query. While this application was not explored in my written thesis, I did touch upon it in my thesis presentation.

⁶⁵ This method is inspired by Edo Storm, 'Onze Westerse Beschaving, a Conceptual History of the Idea of the West in the Netherlands, 1875-1994' (Utrecht University, 2022).

The monthly variation of the coverage of the potato blight from 1845 until 1849 shows that the potato blight was mentioned most often at the end of summer and the beginning of autumn (Figure 5). This timeframe coincides with the period in which the potato crop got diseased: current research shows that the fungus that causes the blight infects the potato plant typically when the temperature stays above 10 degrees Celsius and the humidity above 75 per cent for at least a week;⁶⁶ such weather circumstances were common at the end of summer.⁶⁷ Famine, on the contrary, was a phenomenon typically surrounding winter and spring, the period between harvesting and planting when food supplies ran out. While, for some years, usage of *aardappelziekte* increases during the winter months, it is relatively low compared to the late summer and early autumn periods. The temporal usage of *aardappelziekte* therefore suggests that newspapers most actively published about the potato blight in reference to the actual state of the potato crop.

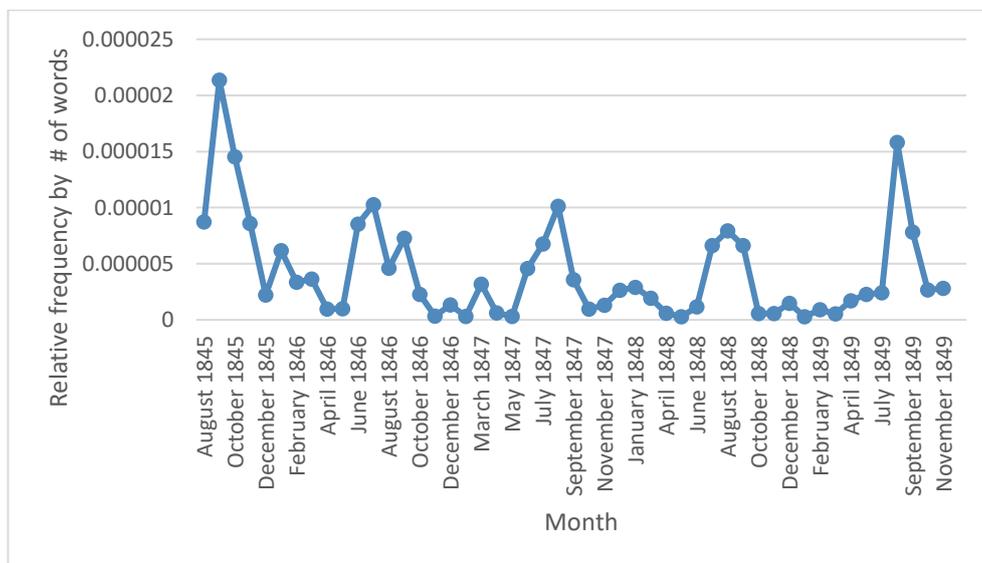


Figure 5: The frequencies of 'aardappelziek*' per month, from August 1845 until the end of 1849, relative to the total number of words per month, based on the data and tools available in I-Analyzer.

A comparative overview of the frequency of *aardappelziekte* in different newspapers shows that coverage of the potato blight varied greatly depending on the newspaper (Figure 6). Regarding the *Drentsche courant*, the high relative frequency of *aardappelziekte* indicates that the potato blight was a much more important topic for this newspaper than for others. I suspect that this newspaper

⁶⁶ Reader, *Potato*, 211.

⁶⁷ Austin Bourke and H. H. Lamb, *The Spread of Potato Blight in Europe in 1845-6 and the Accompanying Wind and Weather Patterns* (Dublin: Meteorological Service, 1993).

specialised in agricultural matters, but following qualitative research has to clarify this result. Also, the *Bredasche courant*, the *Provinciale Overijsselsche en Zwolsche courant*, and the *Groninger courant* wrote relatively often about the potato blight. Two newspapers that had a national outreach and appeared daily, the *Nieuwe Rotterdamsche courant* and *Algemeen Handelsblad*, published the most about the potato blight in absolute numbers, but their coverage of the potato blight did not stand out relative to their total output. While Tilburg remarks that the readership of the *Leydse courant* was interested in pieces about potato consumption during the potato blight, my research shows that institutionalised urban newspapers such as the *Leydse courant* and the *Opregte Haarlemsche Courant* had relatively little interest in the potato disease itself. While it is somewhat difficult to pinpoint a general trend from this result, I suggest that the weight of newspaper coverage of the potato blight lay at a provincial level.

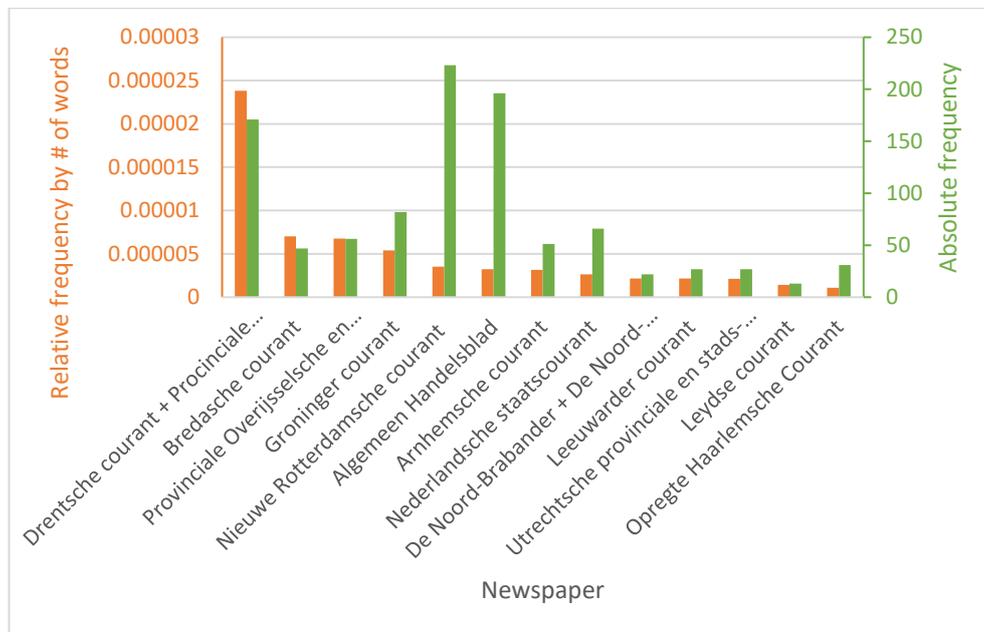


Figure 6: The relative and absolute frequencies of 'aardappelziek*' per newspaper that was published consistently from 1845 until 1855 (the *Drentsche courant* and *De Noord-Brabander* changed their name during this period), based on the data and tools available in I-Analyzer.

A short excursion into the content of the *Drentsche courant* highlights how a provincial newspaper could provide the public space to constitute potato expertise during the blight. When looking at articles about the potato blight in the *Drentsche courant*, a discussion about the causal mechanism behind the disease stands out. A correspondent signing off as Bg. stated in the edition of 13 July 1849 that the exceptional heat of the previous summers should be kept accountable for the crop failure if the disease would not appear that

year, as temperatures had been significantly lower.⁶⁸ Over a month later, on the 21 of August, the physician Dr. David Cohen counterargued the atmospheric causation of the potato blight when the disease had again struck the potato plants in Drenthe.⁶⁹ Informed by his engagement in scientific discussions about the potato blight and his medical expertise, David Cohen held the fungus *Fusisporia solani* as the primary cause. His advocacy for a fungal cause of the potato blight, in turn, provoked a reply by a correspondent S.B., who brought forward local instances that contradicted David Cohen's ideas. For example, S.B. had witnessed that a field with potatoes of the same variety, but sown either early or late in the season, was not homogeneously affected by the potato blight; Instead, healthy and diseased potatoes stood side by side.⁷⁰ S.B. admired the scientific contribution of David Cohen but at the same time voiced the desire for investigation that was more focused on the situation in Drenthe: 'if only others in this province were busy with the potato blight, like Dr. D. Cohen, then we soon would not need to take refuge to treatises about it coming from far away'. It is interesting to see how David Cohen assumed authority as a doctor but was also challenged for his unfamiliarity with in-field potato cultivation. The discussion shows clearly how in the local context of the *Drentsche courant*, practical and theoretical accounts of the potato blight both received a platform and could complement and contrast each other.

I argue that the temporal and spatial dimensions of the newspaper coverage of the potato blight suggest that newspapers provided a dynamic and increasingly accessible platform for expertise constitution. Contrary to the systematic manner of expertise constitution as seen in the national agricultural reports, the seasonal abundance of newspaper articles mentioning *aardappelziekte* during the potato blight suggests that newspapers provided a sphere for potato expertise that grew and shrunk over time. Besides temporal variation, the case of the *Drentsche courant* shows that this dynamicity also functioned geographically. I believe the relatively high coverage of the potato blight by the *Drentsche courant* was not related to an increased potato blight occurrence in Drenthe compared to other Dutch provinces, as the disease affected the potato harvests

⁶⁸ Aardappelziekte. "Drentsche courant". Assen, 13-07-1849, p. 2. Geraadpleegd op Delpher op 13-03-2024, <https://resolver.kb.nl/resolve?urn=ddd:010786314:mpeg21:p002>.

⁶⁹ Aardappelziekte. "Drentsche courant". Assen, 21-08-1849, p. 2. Geraadpleegd op Delpher op 13-03-2024, <https://resolver.kb.nl/resolve?urn=ddd:010786325:mpeg21:p002>.

⁷⁰ Aardappelziekte. "Drentsche courant". Assen, 14-09-1849, p. 2. Geraadpleegd op Delpher op 13-03-2024, <https://resolver.kb.nl/resolve?urn=ddd:010786332:mpeg21:p002>.

throughout the Netherlands, but indicates that newspapers' accessibility increased regionally. To give more insight into how dynamically constituted expertise in newspapers figured in society, I will continue to discuss the content of the newspaper articles writing about the potato blight.

Disease mechanisms, cultivation practices, and food security

The following keyword-based archival research maps the content of newspaper articles writing about the potato blight. I mostly encounter articles that reported instances of the disease, in line with my temporal analysis of the usage of potato blight, which suggested that *aardappelziekte* was mostly used when potato plants on the field were infected by the disease. The analysis furthermore suggests that reports of potato blight occurrences were almost always contextualized. I broadly group potato discourse in newspapers in three different categories: reports of potato blight contextualized by (1) mentioning the progression of the disease along various plant parts, thereby inferring disease mechanisms, (2) referring to cultivation practices that either were suspected to have caused the disease or prevent the disease, and (3) indicating the effect of the potato blight for food security. Before going into the archival research that led to this categorization, I will discuss which keywords I found to be relevant to analyse the newspaper database. After exploring the keywords on a case-by-case basis, I conclude that expertise in newspapers was build upon a multitude of unique local reports that provided opportunities to local potato cultivators to adapt their cultivation practices. A striking difference with expertise constituted in the communal setting discussed in chapter 1 is the anonymity with which newspaper reports were published, which I argue indicates that testimonial accounts were authoritative sources of expertise in nineteenth-century newspapers.

Identifying keywords

I identified 8 keywords that proved relevant for querying the newspaper database for articles about the potato blight, based on the conditions described in the methodology section. 69 words in the period 1845-49 had a cosine similarity value with *aardappelziekte* higher than 0.50 (Table 2). Out of those words, the majority describe a disease in particular, such as *veeziekte*, or aspects of disease in general, such as *epidemie*. Others related to potato or potato cultivation very generally, such as *aardappeloogst* or *gewas*. Moreover, there were several misspelt variants of *aardappelziekte*. Misspelt words, words describing disease generally or particularly, and words related to potato cultivation generally were not selected as

keywords, because I considered them less valuable in narrowing down specific discursive spaces in which the potato blight was discussed.

The 16 words that remained (highlighted in Table 2) were investigated for semantic dependency on the occurrence of the potato blight, i.e., an increasing cosine similarity value with *aardappel** from 1835-44 to 1845-49 (Figure 7). Some words, like *cryptogamen* and *veldmuis* lack values for some periods, as they occurred less than 10 times in the training data for these periods. Other words show a steady similarity pattern over time, such as *knollen*, or show an irregular similarity pattern that cannot be related to the occurrence of the potato blight, such as *insect* or *zandgronden*. Then, there is a group of words of which the cosine similarity value with *aardappel** increases from the period 1840-44, the years leading up to the potato blight, to 1845-49, the first years in which the potato blight was intensely discussed in Dutch newspapers, consisting of *vroege*, *loof*, *stengels*, *rups*, *nachtvorsten*, *kleistreken*, *hongersnood*, and *knol*. It is this last group that I am most interested in as they are both significantly similar to *aardappelziekte* and semantically dependent on the occurrence of the potato blight for their cosine similarity with *aardappel**. The inclusion of a word like *kleistreken* in the selected keywords, while similar words like *kleigronden* and *zandgronden* were discarded, emphasizes the need to check the usage of the keywords in newspaper articles to find out which keywords are indeed indicative of discussion about the potato blight.

Table 2: The 69 words with a cosine similarity value with 'aardappelziekte' higher than or equal to 0.50 for the period 1845-49.

Word	Cosine similarity value	Word	Cosine similarity value	Word	Cosine similarity value
ziekle	0.72	uredo	0.57	misgewas	0.53
epidemie	0.67	kleistreken	0.57	veldgewassen	0.52
aardappelziekle	0.65	aardappel-oogst	0.57	braakloop	0.52
veeziekte	0.64	muizen	0.56	buikloop	0.52
longziekte	0.64	honigdauw	0.56	cryptogamen	0.52
ziekte	0.64	loof	0.56	besmettelijke	0.52
bederf	0.61	ziekie	0.55	graanoogst	0.52
aardappelvelden	0.61	koortsen	0.54	riekte	0.52
veepest	0.61	rups	0.54	nachtvorsten	0.52
roest	0.61	knollen	0.54	aardappelen	0.51
aardappelzickte	0.61	rubigo	0.54	vroege	0.51
aardappeloogst	0.61	plaag	0.54	veldmuis	0.51
kinderziekte	0.60	stengels	0.54	cholera	0.51
aardappel	0.59	griep	0.54	insecten	0.51
rotziekte	0.59	besmetting	0.53	verrotting	0.51
aardappelziekte	0.59	varkensziekte	0.53	groei	0.51
runderpest	0.59	aardappelplant	0.53	zandgronden	0.51
knol	0.58	gewas	0.53	tongblaar	0.50
veldmuizen	0.58	aardappelziekte	0.53	aardappels	0.50
epidemisch	0.58	insect	0.53	ziekten	0.50
kwaal	0.58	epidemische	0.53	ontsteking	0.50
typhus	0.58	plant	0.53	hongersnood	0.50
kleigronden	0.57	influenza	0.53	mazelen	0.50

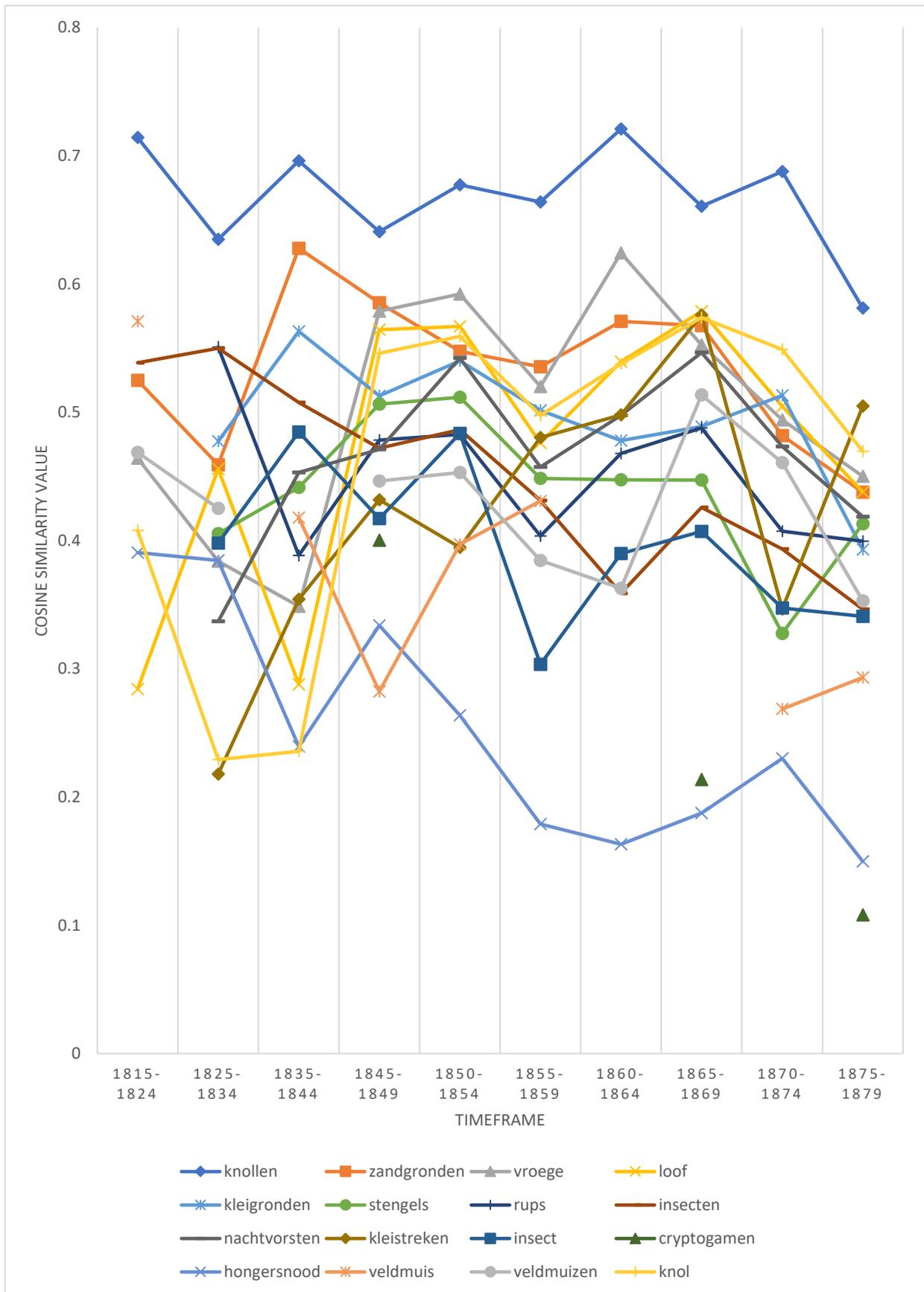


Figure 7: The temporal changes of the cosine similarity values of the 20 selected words, which are not generally related to disease or potatoes, with aardappel*.

Querying with the keywords

The results of collecting use cases in the online Delpher newspaper database for each identified keyword give an extensive overview of the different ways the potato blight was discussed in Dutch mid-nineteenth-century newspapers. When discussing the keywords case-by-case, I pay specific attention to the way each keyword figured as a means to convey knowledge about the potato blight to show how potato expertise was dependent upon different modes of reasoning.

First, *loof* refers to the leafage of the potato plant, which was the first part to show symptoms of the potato blight once a plant had been infected. Use-cases of *loof* suggest that the leafage of the potato quickly became an indicator for the presence of the blight. The *Utrechtse provinciale en stads-courant* wrote in August 1847, for example, that in Zwolle ‘the messages of the last days, regarding the field crops, make us suspect that at some places the disastrous signs of the potato blight, namely the spoilage of the leafage, show themselves again’.⁷¹ Newspapers furthermore shared how the leafage changed over time after infection; the *Landbouw-courant* published the observations of the gentleman Wardenburg saying that the leafage turned yellow first, after which black spots on the crop’s leafage unmistakably revealed the potato blight.⁷² Lastly, in several newspapers, among which the *Zutphense courant*, mowing the leafage right after infection was proposed as a measure against the blight.⁷³ The leafage was thus important in identifying the potato blight, but also in understanding its gradual effects on the potato plant, and measures against the potato blight were at times specifically targeted at the leafage.

Second, *stengels* refers to the stems of the potato plant and was used in similar ways as *loof*. Whereas the leafage was a primary indicator of the potato blight, I suggest that the potato stem more acted as a secondary indicator. As the disease progressed in the potato plant from top to bottom, the stem was mostly affected after the leafage had been infected. Just as the *loof*, *stengels* was used in the context of disease identification and the understanding of infection mechanisms.

Third, *knol*, meaning tuber, played a similar function as *loof* and *stengels* in newspaper articles about the potato blight, but concerns about the state of the potato tuber furthermore concerned

⁷¹ ZWOLLE 5 Aug. "Utrechtsche provinciale en stads-courant : algemeen advertentieblad". Utrecht, 09-08-1847, p. 2. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=ddd:010778975:mpeg21:p002>.

⁷² Aardappelziekte. "Landbouw-courant". Arnhem, 22-07-1852. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=MMUBWA01:000473056:mpeg21:p00003>.

⁷³ Middel tegen de aardappel-ziekte. "Zutphense courant". Zutphen, 25-08-1849. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=MMRAZ02:000298021:mpeg21:p00002>.

food security. Reports about decaying leafage and stems due to the blight were often followed by worries about the consequences for the tubers, as spoilage of the latter would undermine the means of subsistence of many, both humans and cattle. Positive reports about the state of the tuber cheered its good condition despite the plant's infection with the blight – 'from various directions people hear complaints about the potato blight, yet, people are generally of the opinion that the tuber is affected only to a small extent'⁷⁴ – while negative reports lamented the blight's disastrous consequences on the tuber – 'due to the fierce drought we had, the following masses of rain could not rapidly make their way into the soil [...], subsequently we again had warmth, so that the soil completely scalded, causing the much-feared potato blight to reveal itself forcefully at the tuber'.⁷⁵ Tuber talk extended into discussions about the health risks of the consumption of rotten tubers and ways in which rotten tubers could be prepared for consumption safely. Contrary to *loof* and *stengels*, the usage of *knol* in newspapers thus was a central part of potato talk that touched upon issues of food security and safety in relation to the potato blight.

Fourth, *vroege* is an adjective that was used to specify potatoes that were grown early in the season. Harvest results of early potato varieties were regularly discussed in comparison to late varieties. In an article by the *Nederlandsche staatscourant*, it was, for example, mentioned that, in the region Schieland, 'early varieties will yield a half, more late varieties a third or a fourth of the crop'.⁷⁶ Cultivating early varieties had a significant advantage compared to late varieties; because the potato blight usually struck at the end of summer, when early varieties were ready to be harvested or had reached the final stage of their growth, they were less likely to fall victim to the disease than late varieties. The usage of *vroege* was therefore characteristic of the way cultivation practices were adapted to the potato blight, as it fitted within a general trend to shift from the cultivation of late potato varieties to early varieties.

Fifth, the usage of *nachtvorsten*, night frosts, stood in close relation to the shift towards the cultivation of early potato varieties.

⁷⁴ Berlijn, 31 Augustus. "De Nederlander : nieuwe Utrechtsche courant : (staatkundig- nieuws-, handels- en advertentie-blad) / onder red. van J. van Hall". Utrecht, 05-09-1848, p. 3. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=ddd:010067109:mpeg21:p003>.

⁷⁵ LANDBOUW. "Provinciaal dagblad van Noord-Brabant en 's Hertogenbossche stads-courant". 's Hertogenbosch, 10-09-1852. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=MMSADB01:000000800:mpeg21:p004>.

⁷⁶ BINNENLANDSCHE BERIGTEN. 's Gravenhage, den 1sten September 1849. "Nederlandsche staatscourant". 's-Gravenhage, 02-09-1849, p. 2. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=ddd:010782732:mpeg21:p002>

Early potato varieties were namely more likely to be affected by night frosts than late varieties. The *Landhuishoudelijke courant* commented on the link between the cultivation of early potato varieties and the increased hindrance of night frosts: ‘since people, with the yearly reoccurrence of the potato diseases, increasingly will shift to early cultivation practices, and they thus also will be increasingly exposed to night frosts, it would be of the utmost importance if a means could found to prevent this rotting of the stems’.⁷⁷ While other newspaper articles did not notice the link between shifting cultivation practices and the increasing effect of night frosts, I believe their worries about night frosts affecting the potato harvest should be understood as a direct consequence of the cultivation of early potato varieties.

Sixth, *kleistreken* referred to the clay areas where potato cultivation happened and is indicative of another way the potato blight was discussed in relation to cultivation practices. The *Landbouwcourant* wrote in 1853 that ‘everywhere in our country the decay [of the potato plants] increases extraordinarily and at many places, mostly in the clay areas, the potatoes themselves are found to be already affected’.⁷⁸ Similar to articles writing about early and late varieties, articles writing about the effect of different soil types on the severity of the potato blight fitted in a general trend to shift potato cultivation from clay to sandy soils in response to the blight.⁷⁹

Seventh, *hongersnood* is the only keyword that describes a human state of crisis. Usages of the word typically happened in the context of the situation of Ireland during the potato blight. These could differ from announcements on the current state of the crisis – ‘famine threatens Ireland, scarcity is being feared in Scotland’⁸⁰ – to reports on how the measures taken against famine – ‘they are busy to gather a stock of maize in the districts that are threatened with famine’.⁸¹ Also, the famine in Gallicië, a Spanish region, was covered by the Dutch

⁷⁷ AANVRAGE. Nadeelige gevolgen van nachtvorsten bij Aardappel planten. "Algemeene landhuishoudelijke courant". Arnhem, 22-07-1848. Geraadpleegd op Delpher op 13-05-2024,

<https://resolver.kb.nl/resolve?urn=MMUBWA01:000458043:mpeg21:p00001>

⁷⁸ Aardappelziekte. "Landbouw-courant". Arnhem, 04-08-1853. Geraadpleegd op Delpher op 13-05-2024,

<https://resolver.kb.nl/resolve?urn=MMUBWA01:000475031:mpeg21:p000004>

⁷⁹ Paping and Tassenaar, ‘8. The Consequences of the Potato Disease in the Netherlands 1845–1860’, 153–57.

⁸⁰ ENGELAND. "Arnhemsche courant". Arnhem, 12-11-1845, p. 2. Geraadpleegd op Delpher op 13-05-2024,

<https://resolver.kb.nl/resolve?urn=ddd:010043410:mpeg21:p0002>.

⁸¹ ENGELAND. "Arnhemsche courant". Arnhem, 19-03-1846, p. 2. Geraadpleegd op Delpher op 13-05-2024,

<https://resolver.kb.nl/resolve?urn=ddd:010209513:mpeg21:p0002>.

press.⁸² In line with Bergman's depiction of the coverage of the food crisis in the Netherlands during the blight, newspapers hardly commented on the Dutch famine. All the while, Zadoks estimated the excess death rate due to hunger at over 53,000 on a population of around three million. It should be noted, however, that famine was not experienced equally throughout the Netherlands: clay areas suffered more than sandy areas, and especially poor areas that depended heavily on potatoes for their diet suffered, such as the Bommelerwaard. The lack of news reports of famine indicates that newspapers were still mostly read among elite circles who were less afflicted by the consequences of the potato blight.

Eighth and last, for the keyword *rups*, caterpillar, I did not find articles that related to the potato blight. Instead, it seems that caterpillars were the concern of fruit cultivators and that their occurrence as a nuisance for the fruit harvest was by coincidence happening in the same period. They remain innocent bystanders of the potato blight.

General trends

My keyword-driven archival research highlights that the dominant format for newspaper articles about the potato blight was the report writing about the occurrence of the potato blight. A striking factor of these reports is the anonymity that was involved. Furthermore, the results show that occurrences of the potato blight were almost always contextualised. I argue that these contextualized potato blight reports can be grouped broadly in three categories: disease mechanisms, cultivation practices, and food security.

The category of disease mechanisms suggests increased attention among cultivators for disease progression and causal mechanisms. The words *loof*, *stengels*, and *knol* were typically used to describe the stage the potato blight had reached: a plant whose leafage was infected but stems were intact had only recently gotten diseased, while the infection of the tubers indicated that the disease had progressed more. Thus, the progression of the potato blight was inferred by discussing infected plant parts.

The category of cultivation practices suggests that newspapers provided readers with direct opportunities to adapt to the potato blight. Especially the words *vroege* and *kleistreken* are indicative of reports about the potato blight that provided cultivation context. Given the factual shift of potato cultivation from late varieties to early varieties and from clay soils to sandy soils, I argue that reports tapping

⁸² FRANKFORT den 17 november. "Rotterdamsche courant". Rotterdam, 20-11-1845, p. 1. Geraadpleegd op Delpher op 13-05-2024, <https://resolver.kb.nl/resolve?urn=ddd:010979347:mpeg21:p001>.

into cultivation practices had an important function in guiding local action in taking measures against the disease.

The category of food security shows how potato discourse both served a national and regional audience. The usage of *hongersnood* and *knol* in the newspaper articles both reflect worries about food shortages, although in two distinctly different ways. *Hongersnood* seems to have primarily been a political notion, as newspapers reported on famine in countries abroad, while the occurrence of the potato blight in the Netherlands was less likely to be associated with famine. The usage of *knol*, on the contrary, related potato harvests to food security on a regional level. Noticing that the potato tuber was decaying was effective at foreshadowing hunger, without calling for political involvement.

In different ways, the three categories point towards an engaged audience of agricultural practitioners that depended on newspapers for their understanding of the potato blight. Newspapers widely shared reports about instances of the potato blight that indirectly informed about disease mechanisms, cultivation practices, and food security and, by doing so, provided opportunities for readers to adapt to the potato blight. 33. In the last section, I will explore the importance of scientific and statistical understandings of the potato blight in newspaper discourse.

Scientific potato news

By analysing the semantic similarity of the Dutch words for science and statistics with *aardappel*, I suggest that potato talk in newspapers became slightly more scientific during the blight compared to earlier years. The analysis furthermore points towards a diversifying discourse surrounding potatoes from the 1810s until the 1840s. I believe this result fits well with the image of an engaged agricultural audience at the time of the potato blight, who sought to discuss potato matters in less scientific terms, as shown by the keyword-based newspaper analysis.

The temporal changes of the cosine similarity value between *wetenschap* and *statistiek* and *aardappel** gives a sense of the extent to which potato expertise during the blight was informed by scientific and statistical reasoning (Figure 8). The result shows that from 1815 until 1869, *wetenschap* and *statistiek* had a very similar cosine similarity pattern with *aardappel**. In the first 30 years of this period, the cosine similarity of both words decreases from between 0.15 and 0.20 to about -0.01. I believe the simultaneously decreasing cosine similarity values indicate that potato talk in newspapers diversified over these years due to the emergence of new newspaper titles and the growing and diversifying readership.

In the timeframe of the occurrence of the potato blight (1845-49), the cosine similarity values of *wetenschap* and *statistiek* show a minor peak, increasing from around -0.01 in 1835-44 to around 0.02 in 1845-49. Given that the reference word *landbouw* does not show a peak in this period, I believe this indicates that newspapers, besides being a platform for reports of potato blight instances, provided a platform for the communication of blight-related scientific and statistical investigation. By doing so, newspapers fulfilled a function that they were traditionally familiar with, given the higher cosine similarity values of earlier years. After 1849, however, the cosine similarity values of *wetenschap* and *statistiek* with *aardappel** are back at their pre-potato-blight level. There are therefore no indications that the potato blight sparked prolonged public attention for related scientific and statistical investigations.

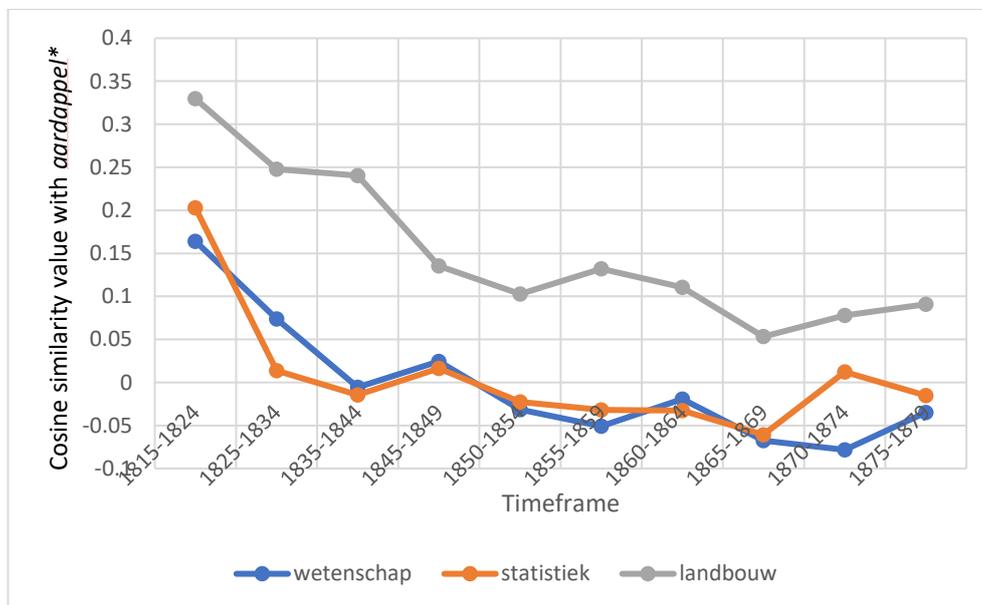


Figure 8: Temporal change of the cosine similarity values of *wetenschap*, *statistiek*, and *landbouw* with *aardappel**, from 1815 until 1879.

Conclusion

In this chapter, I have examined the abundance of newspaper articles published during the potato blight. My analysis points out the dynamical character of newspapers as a platform for expertise constitution. Both temporally and geographically, the coverage of the potato blight was subject to variation: the seasonal variation of potato blight coverage shows that newspapers mostly wrote about the disease when it infected plants in the field, and the uneven distribution of the frequency of *aardappelziekte* among major Dutch newspaper titles suggests that the disease received most attention at the provincial level. Also, based on a keyword-guided content analysis, I have shown

that newspapers served an increasingly engaged group of agricultural practitioners, who wielded farmer notions for their understanding of the potato blight. The frequently published reports about potato blight occurrences were the dominant format for expertise constitution and provided ample opportunity to adapt to the potato blight, as they contextualized disease occurrence with disease mechanisms, cultivation practices, and food security issues. I propose that newspapers, by widely sharing reports about potato blight instances, crafted testimony as a legitimate source for expert knowledge. Lastly, the analysis of the temporal changes in the scientific connotation of *aardappel* has highlighted that the traditionally more prominent science discourse in newspapers revived slightly during the potato blight.

My research puts previous studies of the Dutch press response to the potato blight in a new perspective. While Bergman argues that, like Belgium, most newspapers remained silent on matters concerning the potato blight out of self-imposed censorship, I argue that such an analysis only applies in view of Dutch national politics at the time. Indeed, newspaper articles I analysed showed a tendency to avoid talk about the politically-laden term *hongersnood*. Famine was hardly a word that was used in reference to the Dutch situation; Instead, it described crises abroad. When *hongersnood* did come up related to the Dutch context, it was used to address matters of national policy such as lowering import duties for food and setting up a fundraising campaign to aid the people dying from famine and epidemics in the Bommelerwaard. However, my research shows that famine and hunger was still implicated by the multitude of reports about failing potato harvests and, specifically, about decaying tubers. Therefore, while keeping silent on a national political level, I suggest that newspapers portrayed the scope and impact of the blight in detail on a regional agricultural level.

Also, my research provides a more exhaustive overview of the Dutch press response than earlier studies. Tilburg provides insightful accounts of the *Algemeen Handelsblad* and the *Leydsche courant*, but his choice for these newspapers seems not representative for the Netherlands as a whole. While the *Algemeen Handelsblad* is a rich source to investigate newspaper coverage of the potato blight on a national level and the *Leydsche courant* is representative of the institutionalized traditional urban newspapers, provincial settings remained unexplored. My discussion of the *Drentsche courant* shows how a provincial newspaper could provide the space to discuss the theoretical aspects of the potato blight. The fact that an appreciation for Dr. David Cohen's scientific account of the potato blight coexisted with the contestation of his theory and a desire for more local

contributions indicates that testimonial accounts of the potato blight were perceived to benefit scientific investigation, while local observants stayed sympathetic towards scientists as traditional knowledge authorities. I argue the case of the *Drentsche courant* shows that the potato blight increased accessibility to the newspapers regionally.

By taking newspapers as the object of historical research in this chapter, I have shown that expert knowledge in newspapers was built, not in an orchestrated way, but dynamically, upon a wealth of potato blight reports that used farmer notions to interpret blight occurrences. These reports, furthermore, were in dialogue with more scientific understandings of the potato blight, exemplified by instances of appreciation and contestation. My findings suggest that expertise was constituted more publicly compared to the communal settings discussed in chapter 1. At the same time, however, expertise constitution in newspapers did not provide the sense of community found in societies, nor the systematicity of the corresponding network of the national agricultural reports. In the next chapter, I will look closer into the way science and statistics positioned themselves in the face of the potato blight. I will give special attention to the way they were impacted by the abundance of public attention for the disease, as reflected by the publication boom of newspaper articles.

3 Potato blight science

Historians situate potato blight science in an international context in which prominent scientific contributions are traced back to individual scientists.⁸³ Steven Turner describes how Europe's learned society was divided around two hypotheses regarding the causal agent of the potato blight by 1846.⁸⁴ First, there was a group of botanists and academic commentators who drew on mycological studies, such as those by the British Miles J. Berkeley and the Belgian Charles Morren, to argue that the potato blight was caused by a fungus. Second, there was a group of agronomists and agricultural practitioners who gathered around 'a hodgepodge of explanations', including weather circumstances, atmospheric miasma's, and degeneracy of the potato itself, to explain the occurrence of the blight. Anti-fungalists tended to see the fungus as a symptom of the potato blight, not a cause. Furthermore, by adhering to theories of potato degeneration, they understood the potato blight to be linked to earlier potato diseases, such as curl, taint, or dry rot, which were often associated with the same cause. The anti-fungal theories soon became mainstream, while the fungal theory only relived in the early 1860s when Heinrich Anton de Bary elucidated the life-cycle of the fungus, called *Peronospora infestans* by then. Turner calls the dominance of anti-fungal theories among agronomists and agricultural practitioners 'a sign of the credibility problem among farmers that plant pathologists were to face for the rest of the century'. In this chapter, I want to examine how scientists positioned themselves in the public debate about the potato blight, given their unique theory compared to mainstream opinion.

While before the potato blight, Dutch potato expertise remained a domestic affair situated in learned societies and corresponding networks (chapter 1), during the blight, Dutch scientists emerged as experts in regional, national, and international potato discourse. Their scientific identity was no longer that of the civil scientist, who addressed local societal issues in a collective setting, but that of the individual professional scientist, who practised research

⁸³ Thomas P. O'Neill, 'The Scientific Investigation of the Failure of the Potato Crop in Ireland, 1845-6', *Irish Historical Studies* 5, no. 18 (1946): 123-38; P. M. Austin Bourke, 'The Scientific Investigation of the Potato Blight in 1845-6', *Irish Historical Studies* 13, no. 49 (1962): 26-32; Christina Matta, 'Spontaneous Generation and Disease Causation: Anton de Bary's Experiments with *Phytophthora Infestans* and Late Blight of Potato', *Journal of the History of Biology* 43, no. 3 (August 2010): 459-91, <https://doi.org/10.1007/s10739-009-9220-1>.

⁸⁴ R. Steven Turner, 'After the Famine: Plant Pathology, *Phytophthora Infestans*, and the Late Blight of Potatoes, 1845-1960', *Historical Studies in the Physical and Biological Sciences* 35, no. 2 (1 March 2005): 341-70, <https://doi.org/10.1525/hsp.2005.35.2.341>.

isolated from society.⁸⁵ Bert Theunissen notes that, meanwhile, as universities transformed from centres for academic education in the first half of the century to centres for research in the second half, the propagation of the ideals of duty and community remained important for scientists to convey the social relevance of their work.⁸⁶ Robert-Jan Wille furthermore argues that professional scientists shaped scientific enterprise by raising expectations from state governance as the protector of society.⁸⁷ I suggest that the potato blight, as a national crisis, was taken by mid-nineteenth-century scientists as a prime opportunity to refigure their social position from civil scientist to research-driven expert, thereby also rethinking their relationship with the Dutch state.

In the face of the potato blight, scientists crafted the laboratory, which had made its way from German universities to the Dutch, as a site for the constitution of expert knowledge.⁸⁸ This influence becomes especially clear from my discussion of Jacob Moleschott and E.H. von Baumhauer's monograph about the potato blight. These scientists, schooled in the German medical physiological tradition, not only build their theories and recommendations upon laboratorial microscopic investigation and chemical experiments. Also, the scientists Ali Cohen and Acker Stratingh, representatives of the emerging hygienic movement, used microscopic drawing to bolster their understanding of the potato blight based on primary and remote causal mechanisms. I argue that such drawings, chemical experiments, and the vocabulary of causal inference were used as rhetorical devices to demarcate scientific investigation from the abundance of unscientific literature about the potato blight, as reflected by the newspaper articles discussed in chapter 2.

The measures against the potato blight proposed by scientists crafting themselves as scientific experts reflect their understanding of the disease, but also underline the social relevance of their work. Moleschott and Baumhauer provided potato cultivators with clearcut advice on how to adapt their practices based on their research, while the Dutch state was also urged to take action. While Ali Cohen and Acker Stratingh only focused on contributing to the mechanistic understanding of the potato blight, and thereby bought into a science-for-science ideal, the hygienic movement's expectations towards the Dutch state were more extensive than those raised by Moleschott and Baumhauer. Specifically, the hygienist David Cohen urged the

⁸⁵ Maas, 'Civil Scientists'.

⁸⁶ Bert Theunissen 1955-, *'Nut en nog eens nut': wetenschapsbeelden van Nederlandse natuuronderzoekers, 1800-1900* (Hilversum: Verloren, 2000).

⁸⁷ Robert-Jan Wille 1979-, *Mannen van de microscoop : de laboratoriumbiologie op veldtocht in Nederland en Indië, 1840-1910* (Nijmegen: Vantilt, 2019).

⁸⁸ Wille, 29.

government to orchestrate both potato blight science and the nationwide execution of a fungicide, once found.

My discussion of Herman Christiaan van Hall, a renowned agricultural scientist already before the potato blight, shows that scientific expertise was not only crafted by scientists themselves, but also sought after by both society and the state. While Van Hall, contrary to other scientists, did not depend on original research about the potato blight for contribution to the debate, his experience with potato cultivation secured his expert authority. In state-initiated debate by four scientists, including Van Hall, the lack of proposed measures targeted at governmental action suggests that the state acted more as a patron of expertise than as a stakeholder.

The emergence of individual scientific experts who adhered to the fungal theory suggests that Lidwell-Durnin is right when he argues that the potato blight required to rethink the relationship between disease occurrence and cultivation practices as held within the data-gathering infrastructures of the period preceding the potato blight. However, I will argue, lastly, that besides the emergence of demarcated scientific expertise, the data-gathering infrastructures proliferated and flourished in the face of the potato blight. I revisit the data-gathering project of agricultural statistics as touched upon in chapter 1 to show how statistics held a profoundly different relationship with the potato blight than science that sought to unravel the disease mechanism underlying the disease.

Professionalized science

Moleschott and Baumhauer

Dr. Jacob Moleschott and Dr. E. H. von Baumhauer were one of the first to comment on the potato disease. On the 15th of August, they shared some of their preliminary findings in the *Utrechtsche courant* and, later the same month, they published a monograph on the matter.⁸⁹ Moleschott and Von Baumhauer both had a background in chemistry and Moleschott specialised in the analysis of the chemical composition of foodstuffs. Scholars like Moleschott and Von Baumhauer were drawn to the investigation of the potato blight by its urgency and omnipresence. While Moleschott had written a critique of Liebig's theory on the feeding and growth processes in plants a year earlier and had thus already been introduced to plant physiology, his

⁸⁹ UTRECHT 13 Aug.. "Utrechtsche provinciale en stads-courant : algemeen advertentieblad". Utrecht, 15-08-1845, p. 3. Geraadpleegd op Delpher op 21-03-2024, <https://resolver.kb.nl/resolve?urn=ddd:010779295:mpeg21:p003>; Jac. Moleschott and G.H. Von Baumhauer, *Het Wezen Der Aardappelziekte En de Middelen Ter Voorkoming En Genezing van Dezelve* (Utrecht: August Bötticher, 1845).

and Von Baumhauer's writing on the potato blight was unique in that it addressed a pressing social issue and sought an audience beyond the academic circle.⁹⁰ Their work, therefore, brought methods and perspectives to the agricultural sciences that were novel in this field. In the subsequent debate in the Netherlands over the origins of the potato disease, Moleschott and Baumhauer's views acquired significant traction, making them worthy of further analysis.

The monograph was targeted at a wide audience, as the scientists addressed both the 'simple peasant, and the learned naturalist'.⁹¹ They hoped to teach the peasants the value of scientific investigation and show them that 'healthy reasoning' can improve agricultural practice significantly. The motto on the title page succinctly states the patriotic duty to which these gentlemen answered: 'a learned man, who does not express and work, is like a cloud without rain'. The way these scientists propagated duty and inspire rational thinking is continuous with earlier learned societies.

Their methodology, on the other hand, shows a new development, as they draw a sharp distinction between those investigative instruments accessible to everyone, and those that define science. It consisted of three distinct practices: in-field observation, microscopic observation, and chemical experiment. Everyone was considered capable of concluding that 'the disease starts from the top', after witnessing diseased potato plants themselves.⁹² The process by which the blight affected the plant started with the blackening of the leaves and continued with the rotting of, first, the stem, and, afterwards, the roots and tubers, which developed a flaky, crude surface. By removing the peel, one would notice yellow-brownish and black colouring. By emphasizing that these phenomena are recognizable by simple observation, they invited readers to agree by shared examination.

Using magnifying glasses or microscopes, on the contrary, was nothing like a layman practice according to Moleschott and Baumhauer. Only by the use of 'skilled eyes' could one reliably observe the 'cryptogamic species' living on the leafage of the potato plant with a microscope. Even agronomists were warned to not be deceived by their lack of training: when inspecting a thicker slice of potato, one should not identify the lines and stripes resulting from overlapping cells as the threads of fungi. The microscope was institutionalized as part of German-based academic medical training that Moleschott and

⁹⁰ Jac. Moleschott, *Kritische Betrachtung von Liebig's Theorie Der Pflanzenernährung, Mit Besonderer Angabe Der Empirisch Constatirten Thatsachen*. (Haarlem: Erben F. Bohn, 1845).

⁹¹ Moleschott and Von Baumhauer, *Wezen Der Aardappelziekte*, 3–4.

⁹² Moleschott and Von Baumhauer, 4.

Baumhauer received and could therefore be effectively used by them as a way to add scientific depth to the public discussion about the potato blight.

In addition to careful observations of the process of infection and the morphology of the fungi, chemical experiments were conducted to analyse the composition of the fungus and the diseased tuber. According to the latest academic findings by the scientists Mulder and Harting, the threads of fungi were treated with iodine and sulfuric acid to test for cellulose. Also, the starch concentration in the potato was established with iodine and the protein concentration with nitric acid and ammonium. Such chemical practices moved research into the laboratory, a place only accessible to specialists. Both the microscopy and the chemical analysis demarcated science from layman investigation.

Measures against the potato blight proposed by Moleschott and Baumhauer emphasized the social relevance of specialized scientific research and were targeted both at the potato cultivator and the Dutch state. Relying on their chemical framework of reference, they proposed pouring lime water and sulfuric acid over potato plants as means to kill off the cryptogamic species. Farmers were furthermore warned to only choose healthy potatoes as seed potatoes. The state did not receive the kind of clearcut advice as potato cultivators did, but were also urged to take action: 'We may, most of all, expect from the Enlightened care of our High Government that they will use forcefully the means of which effective application without the mediation of higher hand, partly by ignorance, partly by selfishness, is so often impeded.' By suggesting the applicability of their research in general, and of their chemical experiments specifically, Moleschot and Baumhauer established the social importance of their work.

Overall, Moleschott and Baumhauer are a prime example of scientists who professionalized their work by bringing distinct methodologies and theories to the public debate about the potato blight. By taking the potato in the chemical laboratory, the two produced results that were not achievable by looking at potatoes in the field. Although, due to a lack of agricultural familiarity, the results did not transfer to in-field potato cultivation, the potato blight acted as a convenient case study to advance their chemical framework of scientific reasoning.

The hygienic movement

From the 1840s onwards, a hygienic movement was emerging in the Netherlands that embraced the ideals of social medicine fully. Aiming to improve the bad social and medical conditions of peasants, the hygienics looked at preventive measures to raise the quality of

public health.⁹³ They had a keen eye for environmental influences on the body and looked at the state to build a national medical infrastructure that would raise the standards of living. As the potato fitted well with the hygienic ambition to raise public health through preventive measures such as a nourishing diet, a response from the hygienic movement did not stay out when in 1845 the potato blight caused nationwide failures of the potato harvest.⁹⁴

In November 1845, Levy Ali Cohen, a prominent hygienist with a great awareness of the influence of socio-economic background on life expectancy, published *De Natuur van de Ziekte der Aardappelen* together with doctor Acker Stratingh.⁹⁵ The text had earlier been presented at the *Genootschap ter Bevordering der Natuurkundige Wetenschappen te Groningen* and therefore was rooted in the culture of learned societies that characterized the period preceding the potato blight. However, the treatise by Ali Cohen and Acker Stratingh was the result of more specialized and professionalized research.

With their investigation, these doctors hoped to contribute to a discourse about the potato blight that they perceived as abundant and often shallow: ‘while many of you – rightly so – will already have been satiated by the not rarely superficial readings about the potato blight, I believe to not be deceived, when I am flattered that you nonetheless find private investigations concerning such an important topic not yet unnecessary or useless’.⁹⁶ The quote underscores that Ali Cohen and Acker Stratingh believed the added value of their contribution to exist in their distinct way of research.

Just like Moleschott and Baumhauer, this distinct way of research depended on microscopic investigation. The treatise by Ali Cohen and Acker Stratingh included drawn drawings of various parts of the potato plant to bolster their argument (Figure 9). In the interpretation of these images, the doctors showcased clear ideas about the pattern of causation underlying the disease, distinguishing a ‘direct’ cause from several ‘remote’ causes. The direct cause was thought to be a fungus, while the conditions under which the fungus flourished were mentioned as remote causes. I believe both the microscopic images and the emphasis on theories of causation had an

⁹³ Henk Van Zon, ‘Nederlandse Hygiënisten, Tussen Droom En Werkelijkheid, 1850-1875.’, *Groniek* 29 (1996 1995): 187–97.

⁹⁴ The hygienic Allebé praises the potato for its nourishing qualities just before the appearance of the potato blight. G.A.N. Allebé, *De Ontwikkeling van Het Kind Naar Lichaam En Geest; Eene Handleiding Voor Moeders Bij de Eerste Opvoeding* (Amsterdam: Caarelsen&Co., 1845), 220–21.

⁹⁵ Cohen L. Ali and Gozewinus Acker Stratingh, ‘De Natuur van de Ziekte Der Aardappelen.’, *Mededeelingen Uit Het Gebied van Natuur, Wetenschap En Kunst; Inzonderheid Met Betrekking Tot Ons Vaderland, En Tot Het Bedrijvige Leven* 11, no. 5 (19 November 1845): 65–80.

⁹⁶ L. Ali and Acker Stratingh, 65–66.

important rhetorical function in demarcating scientific from unscientific investigation.

Ali Cohen and Acker Stratingh's motivations to engage in the discussion about the nature of the potato blight can be well understood from their hygienic interests, but their contribution did not mention any preventive measures through which the hygienic movement wanted to overcome the disease. It seems thus that they advertised their research based on the ideal of science-for-science. In the broader hygienic movement, however, Ali Cohen and Acker Stratingh's work was used to urge state-action. The hygienist Dr. David Cohen (seen in chapter 2) not only saw the Dutch state as most fit to orchestrate scientific investigation into a fungicide but also to implement its application in potato cultivation once found: 'Of course will the national government be most suitable to take the initiative in such an extensive case. She allows to achieve the most purposeful experiments, and to execute the best means of eradication of this disease'.⁹⁷ The hygienic response to the potato blight suggests that the disease was an exciting opportunity for scientists to emphasize the social relevance of their seemingly fundamental scientific work.

⁹⁷ "Drentsche courant". Assen, 21-08-1849, p. 2. Geraadpleegd op Delpher op 28-06-2024, <https://resolver.kb.nl/resolve?urn=ddd:010786325:mpeg21:p002>

Ziekte der Aardappelen in 1845.

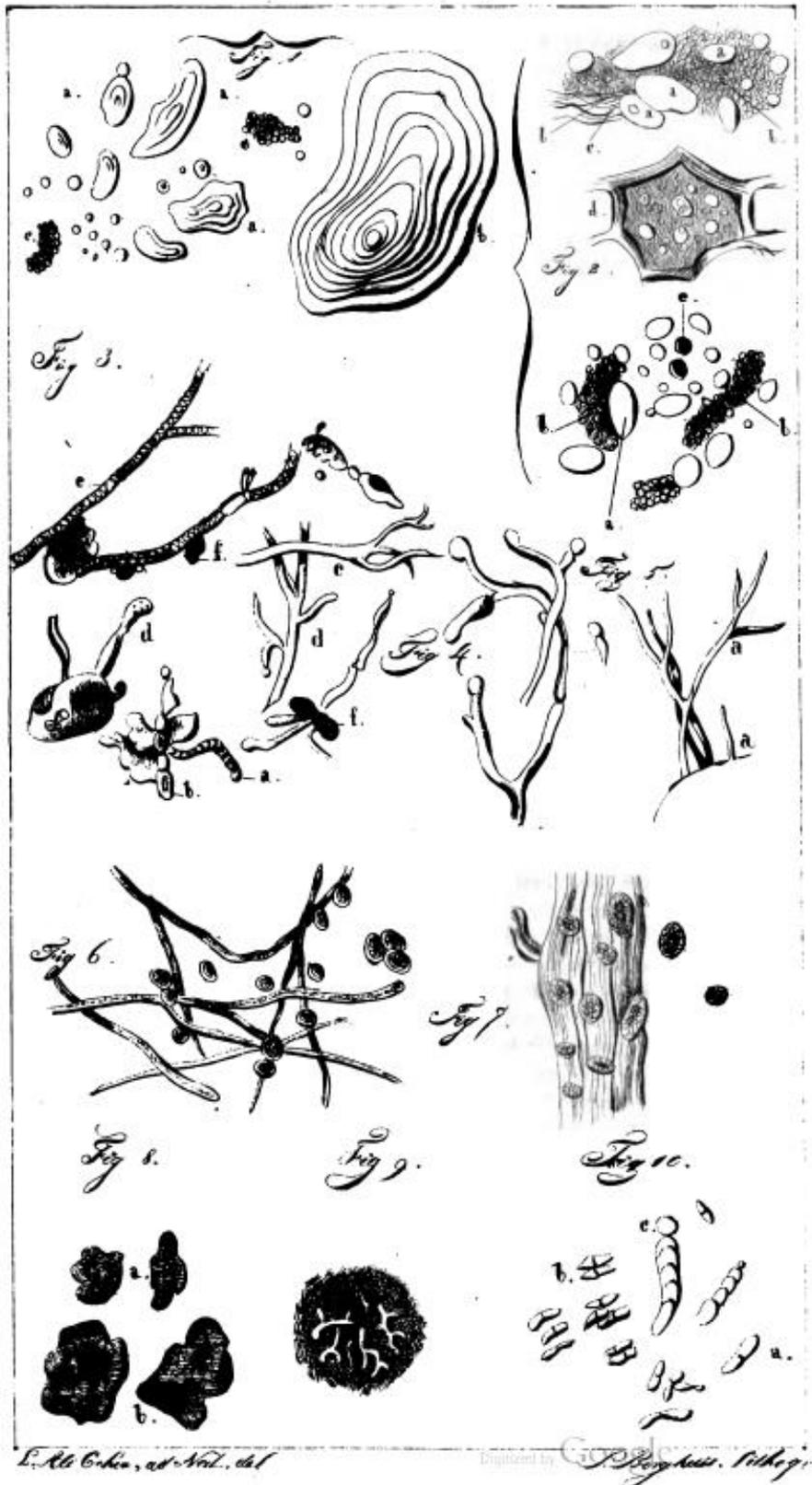


Figure 9: Microscopic drawings by Ali Cohen (1845).

Van Hall

Herman Christiaan van Hall was one of the few people with a thorough understanding of Dutch agriculture who adhered to the fungal theory. Van Hall had regularly published on agricultural matters, including potato cultivation, in the *Tijdschrift van Nijverheid* and at the time of the potato blight he was appointed professor of botany and agronomy at the University of Groningen.

Van Hall contributed to the potato blight discourse in a regional newspaper and a discussion group of scientists. First, at request, he voiced his thoughts about the potato blight in the *Groninger courant*. As for other scientists, he addressed the wealth of literature about the disease: 'a lot of good things, although also a lot of little meaning has been written about this weighty topic'.⁹⁸ His suggestions were largely taken over in a report by the Committee of Agriculture of Groningen, published on 16 September in the *Nederlandsche staatscourant*.⁹⁹ This report, in turn, had a considerable national and international outreach, as it was published in many other Dutch newspapers and also in Ireland.¹⁰⁰ Later, Van Hall was involved in a state-initiated scientific discussion about the potato blight.¹⁰¹ Together with Vrolik, Numan, and Brants, Van Hall was requested, on behalf of the king, to advise on the cause of the potato blight, measures to be taken against it, uses of rotten potatoes for consumption, and treatment of rotten potatoes to make them more fit for consumption. The following report was published in the *Nederlandsche staatscourant*. Contrary to other scientists discussed in this chapter, Van Hall's contributions suggest that he was a recognized expert on the topic without doing much original research on the potato blight.

Methodologically, Van Hall's contributions depended on ongoing gardening experiments. Van Hall's adherence to the fungal theory concerning the cause of the potato blight was, among other things, informed by the fact that in his university garden, 22 different

⁹⁸ Wenken nopens de Aardappelziekte. "Groninger courant". Groningen, 09-09-1845, p. 2. Geraadpleegd op Delpher op 19-03-2024,

<https://resolver.kb.nl/resolve?urn=ddd:010771055:mpeg21:p002>

⁹⁹Verslag der Commissie van Landbouw in de provincie Groningen over de thans heerschede Aardappel-ziekte. 's GRAVENHAGE, den 15den September 1845.. "Nederlandsche staatscourant". 's-Gravenhage, 16-09-1845, p. 2. Geraadpleegd op Delpher op 21-03-2024,

<https://resolver.kb.nl/resolve?urn=ddd:010089708:mpeg21:p002>

¹⁰⁰ Thomas O'Neill mentions the report was published in the Nenagh Guardian and in other papers. O'Neill, 'The Scientific Investigation of the Failure of the Potato Crop in Ireland, 1845-6', 129.

¹⁰¹ Verslag der Eerste Klaase van het Koninklijk Nederlandsch Instituut van Wetenschappen, Letterkunde en Schoone Kunsten, over de heerschede ziekte der aardappelen. "Nederlandsche staatscourant". 's-Gravenhage, 22-09-1845, p. 2. Geraadpleegd op Delpher op 19-03-2024,

<https://resolver.kb.nl/resolve?urn=ddd:010089713:mpeg21:p002>.

potato varieties were planted and all were decaying as a result of infection. While Van Hall did not depend on similar strong rhetorical devices as microscopical drawings or chemical experiments, his gardening experience and track record in the agricultural sciences secured his position as an expert.

Aware of the need to take serious action against the disease, Van Hall proposed several measures. The measures proposed were all aimed at eliminating the fungus, but they were diverse in their application, being directed at harvesting, storing, and cultivating the potato. Van Hall proposed to only harvest potatoes from dry soils and to burn the leafage of diseased potatoes. Anticipating the potato blight to strike again next year, Van Hall, furthermore, advised to use only healthy seed potatoes or potato seeds, which both would not carry the blight, and to only cultivate potatoes in soils treated with limewater or diluted sulfuric acid, soils that were generally more dry and sandy, or soils where no potatoes were cultivated in 1845. The referral to limewater and diluted sulfuric acid by Van Hall shows a clear influence by Moleschott and Von Baumhauer. Besides restating the suggestion of Moleschott and Von Baumhauer, Van Hall's suggestions on treatments of infected potato plants stand out for the way they connect a medical theoretical understanding of the disease to effective concrete practical measures.

In the discussion with other scientists in the report of the First Class of the Royal Dutch Institute of Letters, Sciences, and Fine Arts, Van Hall's measures were met with incomprehension. Treating the potato plant with limewater or diluted sulfuric acid was only deemed beneficial by Van Hall, as he was the only adherent of the fungal theory in this group. Alexander Numan, a veterinarian, not only thought this measure to be ineffective in combating the disease, as it would not take away the cause of the blight but also imagined it to be impracticable due to its considerable costs. The measures earlier proposed by Van Hall in the Groninger courant were restated and were the only concrete measures proposed. G. Vrolik, botanist and anatomist, noted that the cultivation of 'pure fruit' on 'pure land' would prevent the potato blight from reappearing and Brants stressed the importance of not 'exaggerating' potato cultivation, as maximalising a field's output would lower the starch concentrations. While this report was state-issued, none of the measures proposed was targeted at state action, suggesting that the government figured more as a patron than as a stakeholder of expertise.

Professionalized statistics

Contrary to science, which demarcated its practices from the wealth of layman contributions to the public debate about the potato

blight by downplaying their quality, agricultural statistics held a more constructive attitude towards the cultivators' willingness to share data. The annual agricultural report of 1845 was the first to comment on the impossibility of touching upon all contributed pieces about potato cultivation in the Netherlands: 'We will have to be content to only here and there take over something from these important documents'.¹⁰² Besides the usual harvest results, there was room for suggestions about the nature of the potato disease, with theories pointing to weather circumstances or insects. In the reports of 1846 and 1847, the introduction of the potato section again commented on the high amount of received pieces about Dutch potato cultivation. It is clear that, throughout the country, potato cultivators felt the need to share their observations and thoughts concerning the potato blight in extensive contributions, hoping to achieve a national overview and understanding of the disease.

Although the input received by the publishing committee was differentiated, the wealth of data resulted in more quantitative information about Dutch potato cultivation than was seen before the potato blight. Besides the inclusion of tables that provided nationwide quantitative data for all crops, the agricultural reports of 1848 and 1849 included tables from the province of Friesland about potato cultivation specifically. In 1848, this table provided information for forty different cities and townships on the area planted with potatoes, the soil type in which potatoes were planted, the potato varieties used, and the harvest result.¹⁰³ Harvest results could range from a qualitative measure like 'a third' to a quantitative measure like '20 muds'. In 1849, the same table looked significantly different (Figure 10).¹⁰⁴ This time, for each city or township, the amount of harvested potatoes was categorized by soil type and potato variety. Moreover, new additions were the total amount of potatoes harvested for each variety and the mean harvest result to the size of the area cultivated. The strength of the table was that one could glance over to know which potato varieties were most resistant to the potato blight. The tables show how rapidly statistics could improve in response to the agricultural crisis and, moreover, the value that remained attached to choosing the right cultivation practices for successful potato cultivation.

¹⁰² Nederlandsche Maatschappij ter Bevordering van Nijverheid, 'Algemeen verslag wegens den staat van den landbouw in het Koninkrijk der Nederlanden', 1845, 62.

¹⁰³ Nederlandsche Maatschappij ter Bevordering van Nijverheid, 'Algemeen verslag wegens den staat van den landbouw in het Koninkrijk der Nederlanden', 1848, appendix H.

¹⁰⁴ Nederlandsche Maatschappij ter Bevordering van Nijverheid, 'Algemeen verslag wegens den staat van den landbouw in het Koninkrijk der Nederlanden', 1849, appendix E.

STAAT, houdende opgave van de uitke

STEDEN EN GRIETENIJEN.	KLEIGROND.																			
	Getal bebouwde bunders.	Gemiddelde opbrengst per bunder van de verschillende aardappelsorten.																		
		Poepen.	Stoelmatten.	Streefwijers.	Voorge gale.	Herika gale.	Brennerche.	Monterche.	Egghelche.	Beverche.	Welhamers.	Slapflens.	Zerwiche.	Geliterche.	Teeleche.	Roodprunjes.	Buzen.	Witbloepes.	Ronde.	Blauwe.
Bolsward																				
Dockum																				
Franeke	146			180	85	100	170						170		100					
Harlingen																				
Hindeloopen																				
Leeuwarden	19				150		150													
Sloten																				
Sneek																				
Stavoren																				
Workum																				
Yist																				
Achtkarspelen	14			100	80		150		170											
Angwirden																				
Ameland																				
Barlderadeel	20	115		100	65	150	155	250				150	150		150	105			140	
Barradeel																				
't Bild	585	150	150	175		70	160	180	160							150	115			
Dantumadeel																				
Duniawerstal																				
Ferwerderadeel	410			190	90	90	190		190				190							
Franekeradeel	504			100	100	140	100		100				100		100					
Gaasterland																				
Haskerland																				
Hemelumer Oldephaert en Noordwolde.																				
Hennaarderadeel	21				20		95									50				95
Idzarderadeel																				
Kollumerland en Nieuwkruisland	61				62														150	
Leeuwarderadeel	216				67	67		145	250				140					67		
Leemsterland								255	255											
Mensaldumadeel	775	160	205	110	55	145	210			190						180	145			
Oostdongeradeel	580				75	75														
Ooststellingwerf											150		130							
Opsterland																				
Rauwerderhem																				
Schiermonnikoog																				
Schoterland																				
Smallingerland																				
Tietjerksteradeel																				
Utingeradeel																				
Westdongeradeel	265	65		80	45	120	70				105				40	150			50	
Weststellingwerf																				
Wonseradeel																				
Wijmbritseradeel																				
Totaal	5214	150	490	670	802	984	1080	1545	410	945	190	255	150	880	40	820	565	197	190	95
Gemiddelde opbrengst per bunder in de Provincie (in mudden van 60 Ned. ponden.)		150	122	167	100	75	155	154	205	189	190	127	150	146	40	117	121	98	95	95

Figure 10: Snippet from statistical table of the results of the potato harvest in the province Vriesland, during 1849.

Conclusion

All scientists discussed in this chapter explicitly addressed the added value of their research for the public debate over the potato blight. Moleschott and Baumhauer sought to provide cultivators with a taste of scientific reasoning, while Ali Cohen, Acker Stratingh, and Van Hall furthermore discarded part of existing literature as shallow or meaningless. Van Hall's contribution points out that expert knowledge was not only crafted by scientists, but also sought after in society, both regionally and by the state. The other scientists discussed in this chapter had to make a more elaborate effort to craft themselves as research-based scientific experts.

Important for Moleschott, Baumhauer, Ali Cohen, and Acker Stratingh was their distinct methodology in safeguarding a relevant contribution. The two studies by the four gentlemen both depended on microscopic investigation for their results, and I believe their microscopic drawings played an important rhetorical role in conveying their argument. Moreover, Moleschott and Baumhauer explicitly mentioned that microscopic investigation can only be done by trained eyes, thereby granting more credibility to their research. I conclude that scientists writing publicly about the potato blight were concerned with demarcating their research from the widely available layman understanding of the disease, as reflected by the abundance of newspaper articles seen in chapter 2.

Looking at the content of the theoretical work by the scientists, not only did the fungal theory stand out compared to mainstream opinion, but it functioned to advance new research agendas. Most notably, Moleschott and Baumhauer put their potato research in a chemical framework. The chemical experiments they performed functioned to bolster their understanding of the disease mechanisms underlying the potato blight and to promote an innovative measure against the disease, the fungicide, although only proven to work in a lab setting. Moreover, by advancing a chemical framework when attention to the potato blight peaked, Moleschott created room to discuss nutrition generally in terms of chemical composition in later years.¹⁰⁵ Besides Moleschott and Baumhauer's chemical framework, Ali Cohen and Acker Stratingh pushed forward a hygienic way of thinking in their reading on the potato blight. Their distinct understanding of primary and secondary causes of disease tapped into broader medical debates over spontaneous generation and precluded the germ theory. However, as both Ali Cohen and Acker Stratingh were only concerned with the nature of the potato blight, any implications for cultivators of their research were left out, thereby conveying a scientific image of science-for-science. Still, within the broader hygienic agenda, state expectations were raised to orchestrate science investigating the potato blight and to roll out measures against the disease nationwide. Both Moleschott and Baumhauer and the hygienic movement, therefore, not only demarcated science by using distinct methodologies as rhetorical devices but also by suggesting the social relevance of their work.

The emergence of demarcated potato science in response to the potato blight aligns with Lidwell-Durnin's suggestion that the undifferentiated destruction of potato harvests across Europe asked for a different understanding of potato disease compared to the period

¹⁰⁵ Tilburg, "Divine Food" or the "Worst Known Foodstuff"? Religion, Nutrition and Society in Dutch Potato Discourse (1840-1860)'.

before the blight when potato disease was closely related to cultivation methods. However, as also seen in chapter 2, the cultivator's framework for disease proliferated and flourished, coexisting next to professionalized science. The Dutch annual agricultural reports show furthermore that data accumulated quickly in response to the potato blight and that systematic overviews, such as the tables about the potato blight made in Friesland, provided opportunities for cultivators to quickly pick out the most resistant potato varieties. In the end, it were mostly the contributions of citizens and cultivators that guided individual action in fighting the potato blight.

Conclusion

This thesis started with potato expertise constituted in learned societies and corresponding networks. I have shown that the *Oeconomische Tak* and the Dutch state both sought after expertise because of new Enlightened ideas about governance, as happened in France in the same period. By issuing prize questions about potato cultivation, the *Oeconomische Tak* crafted peasant practices and cultivator experimentation as authoritative sources of knowledge. The Dutch state sought to constitute expertise over statistical aspects of potato cultivation, resulting in mostly qualitative accounts of local potato cultivation due to large freedom of correspondents to decide what information to provide in questionnaires and the disparate nature of Dutch agriculture at the time. When farmer representation improved in local agricultural societies emerging during the second wave of agricultural reformation in the 1830s and 1840s, potato expertise became muddled with other community services, such as providing socio-economic security to farmers. Overall, this was a period where people build communities around the ideal of agricultural reformation, thereby exploring the potential of potato expertise.

The potato blight drastically changed the knowledge economy surrounding the potato. Potato cultivators turned to newspapers, which increasingly acted as a platform for expertise constitution. Newspapers showed great temporal and geographical variation in their coverage of the potato blight, suggesting they lacked the systematics of the national agricultural reports and acted as dynamical platforms for potato knowledge. By publishing a wealth of potato blight incidences contextualized by disease mechanisms, cultivation practices, and food security issues, newspapers provided ample opportunity for cultivators to adapt to the disease. While expert knowledge about the potato had a more public character in newspapers, it did not come with the sense of community found in the societies discussed in this thesis.

Scientists writing about the potato blight found in the disease the ideal opportunity to refigure their social position from civil scientist to research-based expert. By referring to their distinct methodologies – microscopic investigation and chemical experiments – they demarcated themselves from the abundance of layman literature about the potato blight. The social relevance of their work was furthermore underscored by using their findings to propose measures against the disease directed at potato cultivation practices, on the one hand, or at state involvement, at the other. Lacking agricultural familiarity, however, such proposals mostly served to advance new research programs. The national agricultural reports at

the time suggest that statistics held a different attitude towards the potato blight than science, flourishing from the attention for the potato without the need to demarcate itself from the abundance of literature. I suggest that, contrary to science, but similarly to newspapers, these reports provided opportunities for cultivators to adapt to the potato blight, allowing to pick the most resistant potato varieties to be planted on the most resistant soils.

To come back to the main question of this thesis, how to characterize expertise throughout the period examined? While Spary describes Enlightenment expertise as unstable and controversial, I would prefer to characterize it as pluriform and imaginative. The Dutch case shows that the one mode of knowing potatoes did not supersede the other, as Spary describes happened during the French Revolution, but that different ways of knowing potatoes coexisted. Before the potato blight, experimental-based solutions for perceived problems in potato cultivation coexisted with statistical knowledge about national agriculture, which included qualitative accounts of the state of potato cultivation. During the potato blight, mechanistic explanations that wielded farmer notions such as *loof* and *knol* coexisted with those that were embedded in scientific causal vocabulary. Furthermore, while the potato blight resulted in more numerical data about potato cultivation than seen before, such data remained to be understood within a framework of cultivation practices as emblematic of the period preceding the potato blight. I conclude that potato expertise, from the late Enlightenment until the mid-nineteenth century, was pluriform in its content, in the people who partook in its constitution, and in the goals it served.

I argue that expertise was imaginative because it sought to inform both governmental and individual action and did so differently at different scales. At the national level, learned societies, agricultural statistics, and individual scientists explicitly expected knowledge to result in agricultural reform. At the local level, agricultural societies perceived expertise as a means to provide socio-economic security. In between the local and the national, newspapers provided a meso-level for the constitution of agricultural expertise, where it emerged from actual reporting about the potato blight. The wealth of potato blight reports did not explicitly ask for state involvement, but, by portraying the scope and impacts of the potato blight, they implicitly suggested the need for action. My thesis suggests that expertise was not only imagined, expertise in turn aided the imagination of national and local identities.

Also, Lidwell-Durnin turns attention towards the way infrastructures characterize expertise. My research highlights the way infrastructures involve and exclude groups of people in the process of

constituting expertise. The societal settings of the *Oeconomische Tak* and the Friesian Society for Experimental Agriculture involved people by pronouncing a community element, wherein members sought to produce knowledge collectively. The agricultural commissions that led to the national agricultural reports figured within a state-imposed infrastructure that ensured community in much the same way as Lidwell-Durnin describes for Great Britain. The contributors involved in the constitution of the expertise in newspapers, however, were less orchestrated and marked by anonymity. In that way, newspapers were quick to serve an increasingly engaged group of potato cultivators when the potato blight struck. I propose that also those sites where infrastructures seem to be lacking, such as mid-nineteenth-century newspapers, are interesting case studies for examining expertise.

Lastly, I want to touch upon the way expertise was characterized by peasant knowledge, as was the case during the French Enlightenment according to Earle. Indeed, also during the late Dutch Enlightenment, elite reformers crafted peasant farmer practices as authoritative sources for expertise constitution. Furthermore, cultivator experimentation by people identifying as *landmannen* – gentleman farmers with hands-on potato cultivation experience – became recognized as an expert authority. When the potato blight struck, peasant practices and cultivator experimentation still informed both newspaper reports and the national agricultural reports, but not demarcated scientific research. As such, however, measures against the potato blight proposed by scientists lacked agricultural familiarity and were, therefore, mostly unused. I suggest that the bottom-up transfer of peasant knowledge was essential in establishing a top-down influence on farmer adaptation to the potato blight, such happened in newspapers.

To conclude, knowledge thrived in response to the potato blight and expertise was constituted in a pluriform and imaginative fashion. By putting the potato amidst attention, the potato blight resulted in an abundance of local observations, scientific specialization, and increasing amounts of cultivation data, with newspapers increasingly acting as a platform for public dialogue.

Acknowledgements

First of all, I would like to thank Robert-Jan Wille and Pim Huijnen for their supervision of my thesis project. Robert-Jan's never-disappointing metaphors – 'become the DJ of your own mixtape' – proved always helpful in guiding my research process and Pim's familiarity with the Digital Humanities undoubtedly raised the quality of my quantitative newspaper analysis. Also, I would like to thank Bert Theunissen and Abigail Nieves Delgado for conversations about my research proposal, Emma Cole and Elisabeth Hiller for their comments on chapters of my thesis, and the HPS community in general for providing a supportive research atmosphere. Lastly, my gratitude goes out towards the people who lighten up my daily life and have provided a listening ear for my potato enthusiasm; I warmly thank my family, my roommates, and Lina.

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