Chapter 4
Farming in Norfolk Around 1800

The grain harvest was little changed from the Late Middle Ages to the nineteenth century. This is demonstrated in this chapter through an analysis of information contained in a selection of eighteenth and nineteenth-century farming diaries from across Norfolk. The county was at the forefront of the agricultural revolution and one of the most productive regions of England around 1800. The detailed farming diaries chronicle a time when agricultural improvement and change formed the basis of the industrialisation in England and fed a rising urban population.

For the grain harvest the decisive change came in the second half of the nineteenth century. In 1851 the American harvesters McCormick and Hussey were shown for the first time in England at the Great Exhibition and these models afterwards entered the English market and became widespread.[1] This mechanisation changed the harvest process in several respects. Whereas harvesting with sickle or scythe in the narrow time slot of eight to ten days as well as the harvesting success greatly depended on a run of good dry days, now the harvest would take place in a much shorter time and when the grain was over-ripe, so that the kernels would fall from the ear into the harvester.[2] Often a number of farmers shared a harvester and had to make arrangements on the availability of the machine.[3] Prior to the mechanisation of the harvest, potential influences on the homogeneity of the harvest date are constituted by the choosing of the stage of ripeness of the corn for cutting and the ongoing breeding of grain varieties. Neither of these factors exercised a substantial influence on the harvest date. Breeding was usually aimed at raising yields as well as increasing the resistance of the varieties against adverse weather conditions like wind and not at altering the harvest date. It is the mechanisation of the harvesting process that blurs the clarity of the harvest date as a temperature proxy to some

[1] Jones, Seasons and prices, 125.

[2] Dickel, Beginn der Mähdruschernte, 75 and Jones, Seasons and prices, 126. The speed of the cutting the crops with a harvester greatly reduced the farmers' vulnerability to weather.

[3] Dickel, Beginn der Mähdruschernte, 76–77. This might be less of a problem in English agriculture, since it is dominated by big farms operating with separate enclosed fields. Therefore a farmer might be more likely to afford a harvester on his own.

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degree. Nonetheless, lately Možný et al. have shown that although the influence of the mechanisation as well as breeding progress and other potential changes is difficult to quantify, these factors do not override the temperature during the growing season as the main determinant of the harvest date.[4]

In Chap. 5 the medieval grain harvest date is used to create a temperature reconstruction for the growing season, the months April to July. For this a comparison series of modern harvest dates from East Anglia is required. Due to the change in harvesting method in the second half of the nineteenth century, the comparison series has to come from a time which predates the introduction of the harvester and for which instrumental temperature measurements are also available. The Central England Temperature series (CET) begins in 1659,[5] hence the comparison series of harvest dates has to come from the 200 years between the mid-seventeenth and mid-nineteenth century. The modern harvest dates analysed in this chapter can serve as this comparison series. Four sets of grain harvest dates are available for Norfolk in the years around 1800. They come from farms at Langham in northern Norfolk, Snettisham in the northwestern part of the county, Fritton which is south of Norwich, and Wymondham which is southwest of the city (Fig. 5.1).[6] Of those only the series from Langham is long enough to be used in a reconstruction of medieval temperatures via the calibration-verification approach. The data from Fritton, Snettisham and Wymondham primarily help to underline the validity of the Langham series to serve as a Norfolk harvest date series around 1800.

4.1 Langham Farm

A farm at Langham in northern Norfolk provides a long and continuous series of grain harvest dates between 1768–1861/1867. The village is close to the north Norfolk coast, and lies on the gentle slopes of the western end of Cromer Ridge (see Fig. 5.1 in Chap. 5). The farm at Langham was in the hands of first the Frost and then the Rippingall family, both families were bound by marital ties. The information on the grain harvest was recorded in a set of annual farming diaries which covers for Stephen Frost the years from 1768 to 1816. In 1788 Thomas Rippingall married the sister of Stephen Frost, Mary, and when he took over the farm in 1817, he must have been well acquainted with the land. In 1816 the farming diary was already in

[4] Dickel, Beginn der Mähdruschernte,75–78 on the problems caused by the introduction of the mechanical harvesters. Možný et al., Cereal harvest dates, 816–817; harvest dates of the period 1501–2008 were analysed.

[5] Manley, The mean temperature of central England, 1698–1952, 242–261, and idem, Central England temperatures: monthly means 1659–1973.

[6] All these records are held by the NRO. Also checked for harvest dates were Cornelius Stovin, Journals of a Methodist farmer 1871–1875; Cozens-Hardy (ed.), Mary Hardy's Diary; and Griffiths (ed.), William Windham's Green Book, 1673–1688, but no harvest date information of sufficient length or frequency could be found.

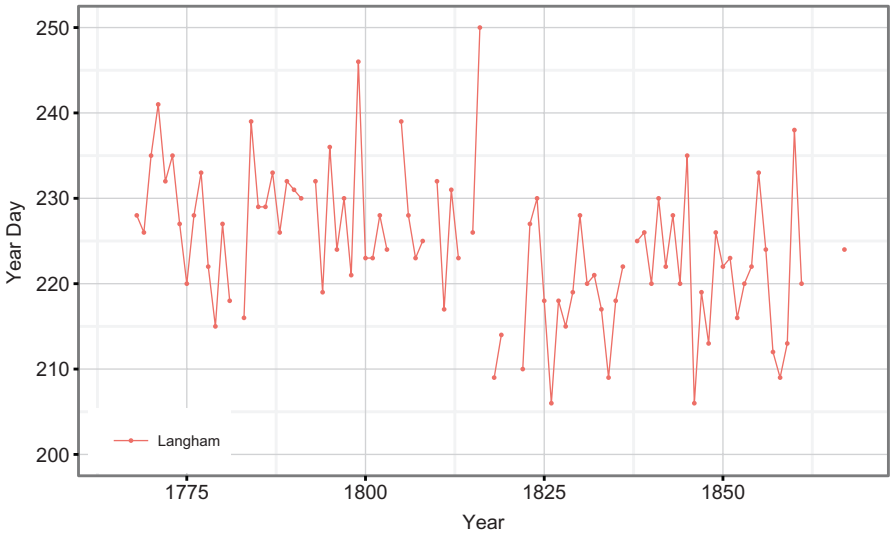

Fig. 4.1 Langham 1768–1867: harvest date. Wheat harvest date and the arrival of the harvest men usually coincide, but when wheat was cut before the arrival of the harvest men, the wheat cutting date has been used in this series

Rippingall's handwriting, even though the farm was officially still managed by Stephen Frost. The farming diaries of Thomas Rippingall run from 1817 to 1831; the 1832 diary was made by him together with his son Stephen Frost Rippingall, for whom information is available for the period 1833–1858. Three personal diaries containing the harvest dates 1859–1861 survive for William Rippingall. Additionally a harvest book was made 1847–1861/1867; in 1856, 1858 and 1867 it is the sole provider of the date of the grain harvest, and in the remaining years it gives identical information to the parallel diaries. Assembling the data from the various sources results in an almost complete harvest date series for the period 1768–1867 (Fig. 4.1).[7] For 86 of these 100 years harvest date information is available, gaps are rare and occur in 1782, 1792, 1804, 1809, 1814, 1817, 1820–1821, 1837 and 1862–1866.

The diaries of Stephen Frost and to a lesser extent those of Thomas Rippingall are very detailed and also contain weather references. Stephen Frost noted the rare cases when the start of the harvest took place either too early or too late in relation to the state of the crops. In 1795 he cut the wheat green, perhaps in line with other farmers for experimenting with early cutting.[8] In 1801 the harvest was begun too

[7] Farming diaries of Stephen Frost of Langham 1768–1816: NRO, MC 120/1-44, farming diaries of Thomas Rippingall 1817–1831: NRO, MC 120/45-57, farming diary of Thomas Rippingall and Rev. Stephen Frost Rippingall 1832: NRO, MC 120/58, farming diaries of Rev. Stephen Frost Rippingall 1833–1858: NRO, MC 120/61–85, personal diaries of William Rippingall 1859–1861: NRO, MC/120/121-123. The harvest book for the years 1847–1861/1867: NRO, MC 120/87.

[8] NRO, MC/120/26. Early cutting was mentioned and disapproved in Anonymous, The practical Norfolk farmer, 104–107.

late, because the turnips had not been hoed in time and the barn was not ready.[9] The diaries after c.1830, when Stephen Frost Rippingall took over the farm, record less information. Especially after the start of the meticulous harvest book in 1847, the farming diaries contain few references about the harvest beyond the start and end date. Until c.1835 the farm was mainly concerned with cattle and corn, afterwards the arable sector dominated.[10] In Norfolk around 1800 various four-to-six-course crop rotations were common.[11]

A Norfolk harvest around 1800 was organized in such a way that the grain crops would be cut in succession, and both stacking and carting would take place between the cutting. The cutting of white peas signalled the beginning and would be followed by the cutting of oats, then wheat and finally barley.[12] The cutting of the white peas and oats took place before the actual harvest. It was not included in the work of the harvest men and was partly performed by women. This concept was fully reflected in Stephen Frost's management of Langham farm 1768–1816. Frost's hired harvest men stayed throughout the whole wheat and barley harvest, also helping carting, stacking and sometimes cutting oats. Neither Stephen Frost nor his successors refer to sowing or harvesting rye in the farming diaries, but they grew wheat in all years. Hence the general harvest began with the cutting of wheat. Labour for harvesting was comparatively scarce in Norfolk due to the absence of greater population centres or industry from the county. Hence the harvest was performed somewhat 'slovenly'.[13] However, the carting of the corn was uncommonly quick and well organized in Norfolk.[14]

Itinerant harvest gangs were employed at Langham farm to help with the harvest of the grain, usually their arrival heralded the start of the harvest. The 'harvest men' normally 'come home' the night before the harvest began. Soon afterwards, often the next day, they were 'ordered at the Bell', presumably they took a celebratory drink in the public house in Langham which is still called 'The Blue Bell'. At the end of the harvest the workers were paid. The information in Stephen Frost's diaries confirms that he kept a close eye on the ripening-stage of his grain crops and often refers to it in the diary; occasionally there are also notes demonstrating the fine temporal adjustment of the commencement of the cereal harvest. Stephen Frost normally hired his harvest men in May, but shortly before the harvest he is sporadically 'warning' his 'harvest men home' for an evening in the immediate future.[15] Nonetheless it was occasionally necessary to begin cutting the wheat with the farm workers and local hired labour shortly before the arrival of the harvest gang. To ensure the capture of the signal of the harvest date in these years, the date of wheat

[9] NRO, MC/120/32.

[10] Afton, Investigating agricultural production, 238.

[11] Anonymous, The practical Norfolk farmer, 9–12.

[12] Anonymous, The practical Norfolk farmer, 99–117.

[13] Marshall, Review of the reports to the Board of Agriculture, 347.

[14] Anonymous, The practical Norfolk farmer, 115–117.

[15] For example 1777: NRO, MC 120/10, 1781: NRO, MC 120/14, 1783: NRO, MC 120/15.

cutting was used for the comparison series instead of the time of the arrival of the harvest gang. Red and white wheat were both sown at Langham.[16]

In the farming diaries the harvest duration is also recorded. The link between harvest length and weather, however, is difficult to determine. This is due to the scarcity of labour in eighteenth and nineteenth-century Norfolk, contrary to medieval times until the middle of the fourteenth century when labour had been abundant.[17] The labour shortage was particularly pronounced during the Napoleonic Wars and later in the 1830s.[18] The harvest process was adapted to the lower input of labour per harvested acre. Whereas in the eighteenth century wheat was generally reaped and the cheaper spring corn mown, between 1820 and 1837 the mowing of wheat took hold in Norfolk.[19] This shortened the harvest duration. Langham farm conformed to this new practice and turned to mowing wheat in the mid-1830s.[20] The spring corn had been mown already in earlier times. Whereas the mean value of harvest duration stands at 34 days for the period 1768–1832, after the introduction of mowing the wheat crop in the mid-1830s it averages at 24 days. The shift from reaping to mowing wheat does not cause a break in the Langham harvest date series. The measured Central England Temperature (CET) spring and summer mean temperatures 1817–1867 relate to the Langham grain harvest dates in the 1830s and 1840s as well as in the 1820s.

[16] Stephen Frost does usually not distinguish his wheat varieties in the harvest accounts, but occasionally mentions red wheat. It is likely that he sowed red and white wheat. Thomas Rippingall is more specific and refers regularly to red and white wheat. His successors hardly ever mention the variety of wheat in the harvest accounts. It can be assumed that red and white wheat were present at Langham farm between 1768 and 1867. According to a farmer cited in Lisle, Observations in husbandry, 132, red wheat that was sown at the same time as white wheat could be ripe a fortnight sooner. None of the Langham farmers distinguishes between red and white wheat with respect to cutting.

[17] Marshall, Review of the reports to the Board of Agriculture, 347.

[18] Collins, Harvest technology, 467.

[19] Wade-Martins, Williamson, Roots of change, 116–117. On the labour saving potential of mowing, see Collins, Harvest technology, 461.

[20] Stephen Frost referred to the wheat harvest with the words ‘cut’ or ‘shear’, all other grains were almost always ‘cut’. The reaping of wheat and the mowing of barley or oats was so common that actively distinguishing between the two methods by refining the vocabulary was unnecessary. Thomas Rippingall was more precise in his wording, to the wheat harvest he referred using ‘reap’, ‘shear’ or ‘cut’, barley and oats were usually ‘mown’. Only in the year 1818 part of the wheat crop was ‘mown’. Stephen Frost Rippingall mowed the wheat in 1835, after 1837 all corn was indiscriminately ‘cut’. Now ‘cut’ probably refers simply to mowing, since all grain crops were now harvested in this way in Norfolk.

4.1.1 The Working Week

In the medieval data the tendency to start the cereal harvests early in the week and during the thirteenth and early fourteenth century also on specific ecclesiastical feast days can be discerned (see Sect. 3.5). In the eighteenth century the ecclesiastical festivals had lost their social importance and could hold no influence over the setting of the harvest date any longer. For the weekday analysis the period 1768–1867 is subdivided into the years when the land was managed by Stephen Frost, 1768–1816, and the years when it was run by his successors, the Rippingalls, 1817–1867. Under Stephen Frost there was a noticeable tendency to start major works at the beginning of the week, preferably on Monday. This included activities such as the start of the harvest and the cutting of wheat, barley and oats. The start of the harvest, which meant the arrival of the harvest men, was most frequently a Monday (42%) and alternatively a Thursday (25.5%), but never fell to a Saturday or Sunday. The start of wheat cutting concentrated with Monday (29.5%) and Tuesday (24.5%) on the beginning of the week, but Friday (16%) forms an end-week high. For barley an almost continuous drop of importance of the weekdays from Monday (31.5%) to Saturday (5.5%) can be observed. Compared to these patterns the end of the harvest was more equally distributed over the week.

In the period after 1817 the importance of the beginning of the week as the time to start the cutting of grain was reduced. Although the harvest mostly still began between Monday and Wednesday, Wednesday (31%) was now more dominant than Monday (24%). After 1833 even Saturday was not avoided as an onset of the harvest (1817–1867: 12%). For wheat cutting, Monday (32.5%) was still strongly overrepresented as a start day, Tuesday and Wednesday (both 17.5%) were also popular, and the end week high fell on Saturday (15%). Wednesday in fact gained importance after 1833, perhaps in connection with the introduction of the mowing of wheat in the mid-1830s, which accelerated the wheat harvest considerably. The beginning of the cutting of barley is independent of the days of the working week. Again the end of the harvest is more or less equally distributed over all weekdays, but a stronger tendency to end the harvest at the end of the week (Friday: 29%), than under Stephen Frost, is visible. Unsurprisingly starting to cut the crops on Sundays is avoided throughout the whole period 1768–1867.

The preference of certain week days, usually at the beginning of the week, for the onset of the harvest and the cutting of individual crops found in much of the Langham data 1768–1867, existed already in the Middle Ages. The mid-week or end-week high of the Langham series were also known in medieval times. Obviously these features were by no means limited to the Middle Ages, but continued for reasons of work organisation at least into the middle of the nineteenth century. These characteristics are more strongly developed in the older Langham data recorded by Stephen Frost 1768–1816; in the latter part of the series 1818–67 these features are weakened.

Table 4.1 The modern harvest date series and the geographically nearest medieval series

Harvest date series	Mean	Min	Max	N
Langham 1768–1816	228.45	215	250	44
Langham 1818–1867	220.17	206	238	42
Hindringham-Hindolveston (Cromer Ridge) 1256–1423	228.93	214	246	56
Snettisham 1809–1827	224.67	207	247	12
Sedgeford-Gnatingdon-Thornham (Northwest) 1264–1431	226.55	204	247	106
Fritton 1803–1828	223.38	208	247	26
Wymondham 1795–1799	230.20	219	244	5
Manors around Norwich (Norwich) 1264–1426	220.66	208	235	58

The medieval series are organized in regional groups, medieval year days are adjusted to the Gregorian Calendar. For the regional pooling of the medieval series, see Sect. 5.1

4.1.2 The Break in the Langham Series

The transition of Langham farm from Stephen Frost to Thomas Rippingall in 1817 coincides with a break in the series of the grain harvest dates (Fig. 4.1). The mean of the series over the period 1818–1867 is about a week lower, than for the period 1768–1816 (Table 4.1). To test the significance of the difference in the means for this period, Student's *t* test was used; this test reveals the difference in means of the periods is significant at $p < 0.01$. A similar shift also occurs in contemporary data from Fritton and Snettisham, but is less pronounced there (Fig. 4.3).[21] Consequently the trend to earlier harvests, that was primarily due to higher growing season temperatures, must have been enhanced at Langham by other factors.

In 1815 Langham parish was enclosed.[22] Changes in the organisation of farming activities might have been the consequence, for example after 1815 the cattle at Langham farm was usually yard-fed.[23] Until 1813 oats were cut mostly shortly before or at the same time as the beginning of the grain harvest and the cutting of wheat.[24] After 1818[25] oats were usually harvested much later than the other grain crops including barley (Fig. 4.2). The difference between the general start of the grain harvest and the beginning of the cutting of oats in this period could amount to 15 or 20 days. Mowing oats at the end of the grain harvest might have saved some days labour before the cutting of the wheat and thereby helped to advance the wheat harvest. Another factor is the stage of ripeness of the grain. Thomas Rippingall might have decided to cut his grain generally at an earlier stage of maturity than

[21] Before 1817 the Langham harvest date was usually a few days after the harvest date of Fritton, after 1817 it usually coincides with or predates the Fritton harvest.

[22] Legislation.gov.uk, delivered by The National Archives, www.legislation.gov.uk/changes/chron-tables/private/25#f2

[23] Afton, Investigating agricultural production, 238.

[24] This is in accordance with the advice from Anonymous, The practical Norfolk farmer, 101–103.

[25] No information on the cutting of oats is available 1814–1817.

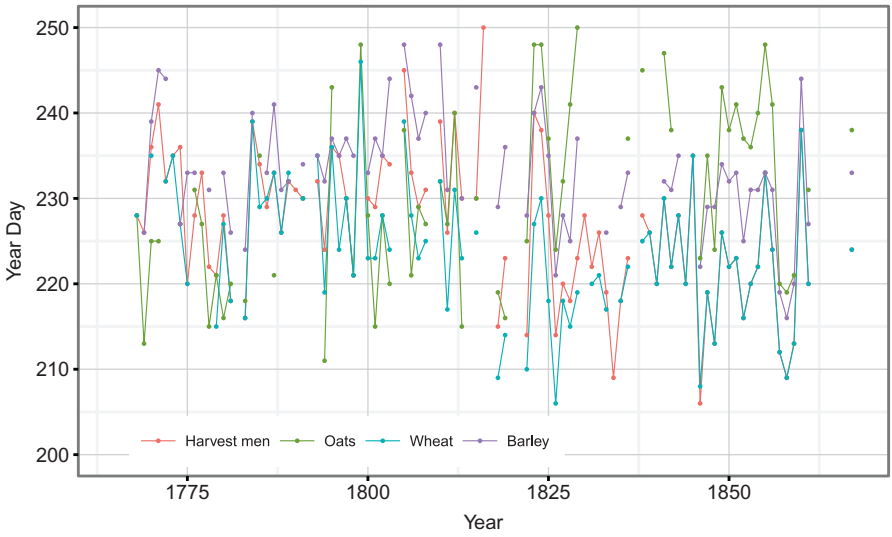

Fig. 4.2 Langham harvest 1768–1867: start of harvest and first day of cutting grain crops

Stephen Frost.[26] This practice gained popularity in the early nineteenth century[27] and would have advanced the harvest date somewhat.[28]

Since the Langham series 1768–1867 is divided by the shift of the mean value at 1817 into two sub-sets, it must be decided which part of the series can be used for

[26] According to Collins, Harvest technology, 460 this could add eight to ten days to the cutting season.

[27] Collins, Harvest technology, 456. He mentions that cutting at dead-ripe stage could occur in the eighteenth century.

[28] In some cases even cutting the corn green occurred. It is mentioned already in Young, General view of the agriculture of the county of Norfolk, 300 which was published 1804. Anonymous, The practical Norfolk farmer, 104–7 condemns the practice of cutting wheat green, which in the years leading up to 1808, the book's publication date, had been the custom of many farmers. Stephen Frost, too, notes in his diary in the week of Monday, 24 August 1795: 'Alway [sic] begin to Cut Wheat Green and you may all other Corn before it is too ripe, which prevent [sic] much spoiling, that often happening [sic] otherwise,' NRO, MC 120/26. However, 1795 was a cold and wet growing season, so that Stephen Frost might simply have had no other option, than to cut his wheat green because ripening was delayed. Cutting corn green is mentioned only a few times in Stephen Frost's diaries up to 1816: 1800 (part of the wheat at the beginning of September), 1802 (barley) and 1805 (oats). His successors reverted to it in 1818 (barley), 1823 (barley), 1836 (wheat), 1838 (oats), 1845 (wheat), 1848 (part of the barley at the end of August) and 1855 (wheat). Out of these years the harvests in 1795, 1805, 1823, 1845 and 1855 were late harvests, not starting before the later part of August. The part of the corn that was cut green was also cut late in 1800 and 1848. Therefore it rather appears that at Langham farm cutting green was practised not as a principle, but only in years of dull summers preventing the crops from reaching maturity even by mid- to late August. In 1845 Stephen Frost Rippingall describes such a situation: 23 August. 'Corn very green from cont[inuous] rain and want of sun.' He began the harvest that day, NRO, MC 120/72. It is likely that the chances for the corn ripening properly after the end of August were diminished due to the advanced season, so that the farmers were actually left with little choice.

calibrating the medieval harvest dates in Chap. 5. Comparing the mean value of the harvest date of the medieval East Anglian composite group (mean of year days 226.69) created by combining all the available harvest data for that period (see Table 5.2) to the mean values of the two Langham sub-series, a strong link between the grain growing conditions on the medieval manors and Langham 1768–1816 (mean of year days 228.45) is evident. Farming at Langham in the earlier part of the series is closer to the Middle Ages with regard to time, than the later part, and the general conditions of farming – as the preference for certain weekdays to begin working or the reaping of wheat – bear also a greater resemblance to the late medieval situation before the farm was handed over by Stephen Frost to Thomas Rippingall in 1817.

4.2 Fritton Estate

Fritton estate was held by Thomas Howes of Morningthorpe, it is situated about 15 km south of Norwich (Fig. 5.1). A continuous series of harvest dates for the years 1803 to 1828 is recorded in farming note-books of the estate (Fig. 4.3, Table 4.1).[29] In the Fritton farming diary a general start of the harvest is announced, which sometimes includes the pea and oat harvest. Where information is available, the wheat harvest often begins a few days later (about two days) than the general harvest. In other cases the two dates coincide. Until 1809 all, except one harvest, began on a Monday, during 1810–1813 all started on a Wednesday. Thereafter the weekdays for the commencement of the grain harvest at Fritton estate were highly variable.

4.3 Snettisham

A small and non-continuous collection of grain harvest dates comes from the lands belonging to Nicholas Styleman at Snettisham. Snettisham is a village in northwest Norfolk close to the coast of the Wash and about 5 km southwest of Sedgeford, one of the important manors of Norwich Cathedral Priory in the Middle Ages (Fig. 5.1). The Snettisham grain harvest dates are given in the journals of Nicholas Styleman between 1809 and 1827[30] and number twelve dates (Fig. 4.3, Table 4.1). The information comprises general references to the start of the harvest as well as references to the cutting of wheat, where both types of data overlap, they are identical.[31] No day of the week is over-represented amongst the grain harvest dates.

[29] Farming diaries for Fritton estate by Thomas Howes of Morningthorpe 1802–1827: NRO, MC 150/52/1-2. The entries were not made daily, but weekly.

[30] Nicholas Styleman, journals 1809–1813, 1815–1827: NRO, LEST/LA 14-28, harvest dates in journals NRO, LEST/LA 15-16, 18–22, 24–28.

[31] The few times that oats are mentioned in the journal, they were usually harvested before the general harvest or the cutting of wheat.

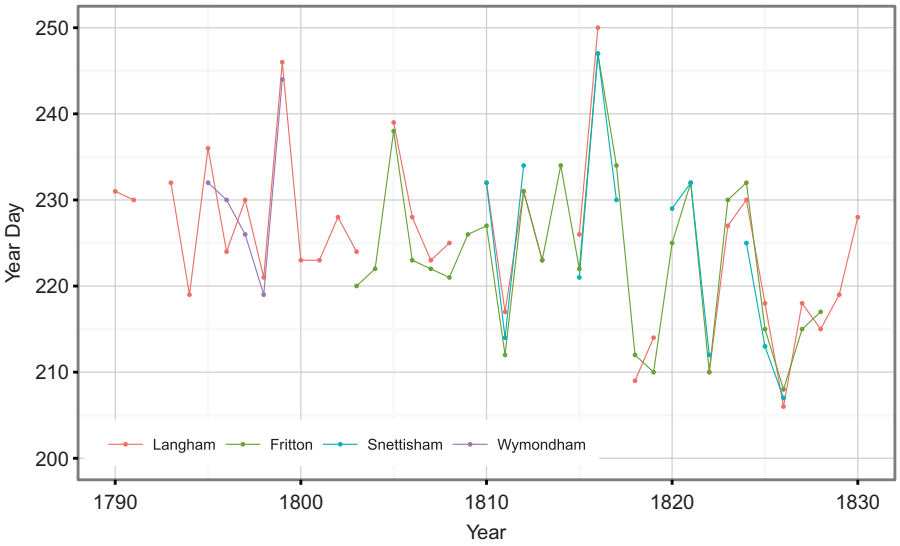

Fig. 4.3 Langham, Fritton, Snettisham and Wymondham 1790–1830: harvest date

4.4 Wymondham

The grain harvest dates found in the farming journal of Randall Burroughes constitute a series of just 5 years, 1795–1799[32] (Fig. 4.3, Table 4.1). Burroughes farmed in the parish of Wymondham, a market town 14 km southwest of Norwich (Fig. 5.1). He began his activities very close to Wymondham, in 1798 he acquired new land at Stannards Farm and focused his farming activities on this location.[33] The information for the commencement of the harvest is either given as a general remark on the start of the harvest or as a reference to the cutting of wheat. The grain harvest dates are distributed equally over the days of the week. The period 1795–1799 includes several cold years and late harvests, therefore the mean value of this short run of harvest dates is very high.

4.5 Medieval Versus Early Modern Grain Harvests

A comparison of the statistical properties of the grain harvest data from Norfolk around 1800 and the series of the medieval manors situated nearest to the modern farms in Table 4.1 shows the medieval and modern data to be in close agreement.

[32] Wade-Martins, Williamson, Randall Burroughes, 65–125. The journal runs from end of 1794 to the end of 1799, entries were not made daily.

[33] Wade-Martins, Williamson, Randall Burroughes, 3.

This applies to the early part of the Langham series 1768–1816 and Hindringham-Hindolveston (Cromer Ridge), to Snettisham and Sedgeford-Gnatingdon-Thornham (Northwest) as well as to Fritton and the medieval manors around Norwich (Norwich). Often the modern data have a slightly higher mean value, because they include the bad and cold years around 1800 and 1816, the 'year without a summer' after the volcanic eruption of Mount Tambora in 1815, whereas the medieval data often omit years marked by very cold growing seasons. As this comparison underlines, the medieval and eighteenth to nineteenth-century data are related and therefore comparable.

The modern harvest date series are highly correlated on the interannual basis (Fig. 4.3). Indeed they almost always display identical trends, and the spread of the dates within a year is reduced, when compared to the medieval data. There is no doubt about the modern harvest dates reacting to the same influence: the mean temperature during the growing season. This relationship forms the basis for the temperature reconstruction that is described in the following chapter.