

Medieval Agrarian Practices: The Determining Factors?

By MAVIS MATE

IN the heyday of high farming several treatises were written giving advice on husbandry, estate management and accounting.¹ While such manuals gave detailed instructions on how to improve the soil, how to manage stock and how to prevent reeves from cheating, there were a number of topics that were not discussed. No advice was given on the best rate to sow seed, on whether or not to sow legumes or how to keep pasture in good shape. Agrarian practices on matters such as seeding rates, cropping patterns and convertible husbandry varied considerably from one part of the country to another. How did landlords make up their minds what policies to adopt? Did they follow the books of advice? Did great lords adopt common policies for all their estates or did farmers, both large and small, within a neighbourhood, follow policies that best suited local conditions?

I

The didactic literature stressed the importance of improving the soil through the use of manure and marl. Walter of Henley, for example, believed that dung and earth mixed together made the best compost and that it should be laid upon the fallow after the first ploughing. He also advised that when sheep were folded on the land 'the nearer it is to the sowing time the better it is'.² Such practices appear to have been quite common. Manure was carried from the cattle and sheep barns onto the wheat fields in the summer or

early autumn and animals who had been pastured elsewhere during the day were folded onto the fallow at night. Where lords were able to take advantage of the sheep of their tenants as well as their own, the tenants were aware of the value of the manure they were losing. On two of the manors belonging to the cathedral priory of Christ Church, Canterbury, the tenants, after the Black Death, paid thirteen quarters of barley a year rather than continue to put their animals into the sheepfold of the priory.³

The addition of marl was generally seen as one of the best ways to fertilize the land. Canterbury Cathedral Priory, in the early fourteenth century, passed an ordinance that on all manors in which marl could easily be found marlators were to be provided and as much land as possible was to be marled in the summer.⁴ In this instance the monks followed a common policy for all their estates and made no distinction between their manors inside and outside Kent. Marling was carried out as vigorously in Essex and Surrey as it was on manors closer to the house. The real problem was that very few manors actually had marl readily available, and, when they did, the marl lasted only for a limited amount of time. On their manor of West Farleigh, for example, small amounts of land were marled in the late thirteenth and early fourteenth century, but, finally, in 1338, a man was hired to fill in a great marl-pit that was now fallowed. Furthermore marling could be very expensive, especially where customary labour was not available. Men were needed to dig

¹ I am grateful to the American Council of Learned Societies for providing a grant that made possible the research on which this article is based. I have also benefited a great deal from discussing the subject matter with Mr A F Butcher at the University of Kent. *Walter of Henley and other Treatises on Estate Management and Accounting* ed. Dorothea Oschinsky, Oxford 1971.

² c 73-4 *ibid*, p 329.

³ Cathedral Archives and Library, Canterbury (hereafter referred to as CALC) Register K fo 167v: Register J fo 92.

⁴ Chapter ordinance printed in R A L Smith, *Canterbury Cathedral Priory*, Cambridge 1943, p 215.

the marl, load it onto carts, and then spread it on the land. The total cost on the Christ Church estates ranged from 8s to 20s 6d an acre, depending on how accessible the marl-pit was, how much marl was spread on the land and whether or not it was necessary to rent extra carts.⁵

Did the Christ Church monks ever ask whether the results justified the expenses? In some areas they did not and the local serjeant did not specify which area was being marled, or if he did, the yield from that particular piece of land. But, at Ebony, where between 1303 and 1311 £56 5s 8d was spent applying manure, marl and lime to the land, more systematic records were kept.⁶ Before 1303, wheat, which was seeded at the rate of four bushels an acre, produced an average yield of 11.69 bushels an acre ($2.92 \times \text{seed}$) and oats, which was seeded at eight bushels an acre, yielded an average of 29.06 bushels an acre ($3.63 \times \text{seed}$). Land that had been treated did produce higher yields. In 1309 oats grown on non-marled land yielded 22.22 bushels an acre ($2.77 \times \text{seed}$) whereas those growing on marled land produced 34.58 bushels an acre ($4.32 \times \text{seed}$). Wheat, which was only grown on marled land, yielded 16 bushels an acre ($4 \times \text{seed}$). While grain prices were high, the Priory clearly felt that such results justified the high cost of marling. But, although Walter of Henley argued that marl lasted longer than dung,⁷ the monks had no way of proving this. In fact Henley was right and at Ebony the effect of the marl and the lime lasted long after it had been applied, for the average yield of wheat for the whole period, 1304-44, was 13.05 bushels an acre ($3.26 \times \text{seed}$), well above the late-thirteenth-century level. Priory officials, however, did not make this calculation and when grain prices fell in the late 1320s and 1330s

expenditure on marling virtually disappeared.

Few fields, however, could be supplied with manure or marl and farmers had to keep their land in good shape in ways not mentioned in the treatises. In eastern Norfolk an average of twenty-four to twenty-six acres were folded with sheep each year, depending on the manor, and on no demesne for which account rolls survive did the area folded ever exceed thirty-five acres. But, on manors within a five-mile radius of Norwich farmyard manure was supplemented by nightsoil purchased from the town.⁸ On the Chiltern farm of Berkhamstead, in 1349, eighteen acres had been manured by the sheepfold, but the arable land there was also improved by the addition of dead leaves and deer droppings gathered from parkland.⁹ Similarly, in Kent, just a small fraction of the total acreage could be manured in any one year. On the archiepiscopal manor of Otford, for example, in 1323/4, thirteen acres were composted with carts and sixteen acres with the sheepfold, the two areas together comprising 10 per cent of the total acreage sown.¹⁰ On the Christ Church manor of Orpington, in north Kent, in 1303/4, the serjeant was able to compost thirteen acres with manure and seventeen acres with the sheepfold, just under 15 per cent of the total acreage sown. The Christ Church monks, however, during the inflationary period of the early fourteenth century, displayed considerable ingenuity when it came to ways of keeping their land in good shape. At Loose a man was hired to take out and cart away large stones from one field and eight hundred heaps of earth were spread over another field. At West Farleigh sixty-four perches of gutter in the Westfield were lined with stone

⁵In 1296 the serjeant at Merstham, in Surrey, marled nine acres for a total cost of £9 5s i.e. for each acre 20s 6d. 188 cartloads of marl were spread on each acre. The major item of expenditure was the cost of carrying the marl at 1d or 1½d a cartload. CALC Beadle's rolls, Merstham.

⁶CALC Beadle's rolls, Ebony.

⁷c 70 Walter of Henley ed. Oschinsky, p 329.

⁸B M S Campbell, 'The Regional Uniqueness of English Field-systems: Some Evidence from Eastern Norfolk', *Ag Hist Rev* XXIX, 1981, pp 22-4; B M S Campbell, 'Agricultural Progress in Medieval England: Some Evidence from Eastern Norfolk', *Econ Hist Rev*, 2nd ser, XXXVI, 1983, p 34.

⁹David Roden, 'Demesne Farming in the Chiltern Hills', *Ag Hist Rev*, XVII, 1969, pp 16-17.

¹⁰Lambeth Palace Library MS ED 830.

to dry out the land.¹¹ But, as was the case with marling, these efforts dropped off when prices fell.

Much advice was also given about the best methods of taking care of stock. Each year the reeve or bailiff was expected to examine the flocks and herds and discard all weak and sickly animals. In addition the author of the *Seneschaucy* suggested that these animals should be put in good pasture for fattening (en bone pasture pur engresir) and when the better ones have improved they ought to be sold to the butchers.¹² Such advice was heeded and, in 1314, the chapter of Canterbury Cathedral Priory reminded the local serjeants that while the ordinary stock was to be kept in good pasture, all the animals not to be retained were to be put in better pasture, fattened and not worked but sold when they were fat.¹³ At the same time the Christ Church officials were raising healthy animals for sale and their own table. In the late thirteenth century, before most of the cows were farmed out, a half to two-thirds of the young calves were sold, either to the cellarer or in the neighbourhood.¹⁴ Similarly some manors regularly sold newborn lambs, while others kept all the stock in order to replenish or expand the priory's flocks. Large sales were most common on the Essex manors of Milton and Lawling and on the two north Kent manors of Barksore and Cliffe, all of which were within easy reach of the London market.¹⁵ Lambs, calves, pigs and wethers were also supplied to the cellarer on a regular basis. These were generally good, healthy animals and in 1333 it was expressly ordained that

animals earmarked for the larder were to be put in good pasture for safekeeping 'so that they may be sound, fit and fat' when needed.¹⁶ The allocation of good pasture for the purpose of fattening stock shows the importance of meat in the medieval diet, but also suggests that there was a ready clientele of butchers and breeders.

Sheep-flocks, of course, were always subject to disease and at times of severe murrain a third or a half of a flock could easily be wiped out. To prevent such a disaster shepherds were advised to watch over their sheep well 'that they are not killed or tormented by dogs . . . and that they do not pasture in forbidden moors, ditches and bogs, thereby contracting illness and rot through lack of supervision'. Furthermore when the lambs were young, the shepherd should pull away the wool from between the teats of the ewes to prevent it from getting into the mouths of the lambs, who might swallow it down.¹⁷ Some estates seem to have followed such advice and when a fairly long series of accounts is available, the death-rate of both adult sheep and newborn lambs appears quite low. In the early fourteenth century, for example, substantial numbers of ewes and wethers were kept on the royal manor of Keyingham in Yorkshire. Although some years as much as 23 per cent of the newborn lambs died, other years as few as 4.4 per cent died. The average death-rate for the lambs (with eleven accounts) was 14.6 per cent.¹⁸ Similar percentages can be found on a number of estates belonging to Canterbury Cathedral Priory. At Meopham, in north Kent, there were a few disastrous years: in 1305 35 out of 55 newborn lambs died, in 1322 46 died out of 60, and in 1333 35 died out of 64. But in good years, out of the average 59 lambs produced each Spring, only eight had died

¹¹ CALC Beadle's rolls, Orpington, Loose, West Farleigh.

¹² c 31-2 *Walter of Henley* ed. Oschinsky, pp 274-5. See also the treatise of Walter of Henley c 76 and 97 (*ibid.* pp 330-1, 336-7).

¹³ 'omnia animalia quae non sunt retinenda in annum futurum ponantur in meliori pastura et impinguantur' Chapter ordinance printed in Smith, *Canterbury Cathedral Priory*, p 214.

¹⁴ At Battle Abbey about a quarter of the calves each year were slaughtered for food: Eleanor Searle, *Lordship and Community: Battle Abbey and its Banlieu, 1066-1538*, Toronto, 1974.

¹⁵ Before 1348 Barksore and Cliffe were selling an average of 55 lambs a year and the two Essex manors of Milton and Lawling were selling respectively an average of 65 and 107 lambs a year. CALC Beadle's rolls, Barksore, Cliffe, Milton and Lawling.

¹⁶ *Litterae Cantuarienses* ed. J B Shepherd, 3 vols. (Rolls Series, 1887-9) II, 35-7.

¹⁷ *Seneschaucy* c 62 and *Walter of Henley* c 105. *Walter of Henley*, ed. Oschinsky, pp 287, 339.

¹⁸ PRO SC6/1079/12: 1079/16-18: 1080/9: 1081/7-9: 1082/3: 1082/5.

by Michaelmas and not one of the lambs was sold. If all the bad years are included, the average death-rate for the lambs at Meopham from 1283 to 1356 was 19.6 per cent.¹⁹ Where significant numbers of lambs were sold regularly, thus reducing their risk of death on the manor, the rate of loss was even lower — 13 per cent at Milton in Essex. So far as stock-raising was concerned, the Priory made no distinction between its manors and seems to have followed common policies, exercising the same care in Essex as in Kent.

II

Where the husbandry manuals were silent, however, practices differed widely. No optimum rates were suggested for the sowing of grain. Indeed the author of the *Husbandry* specifically recognized that 'some lands may be sown more sparsely than others', although he did indicate that in many places wheat, rye and peas might be sown with two bushels an acre, and barley, beans and oats with four bushels an acre.²⁰ Lay and ecclesiastical lords, with estates scattered in different parts of the country, adopted different seeding rates in each area. Battle Abbey, for example, used a much lower seeding rate on its manors in Berkshire, Wiltshire and Oxfordshire than it did in Kent and Sussex.²¹ The Priory of Christ Church, Canterbury, also sowed at higher rates on its manors within Kent than on those outside. Wheat, for example, in Kent was sown at three to four bushels an acre, the same rate as on the Battle estates, whereas on estates outside Kent, it was sown at two or two-and-a-half bushels an acre, the rate suggested in the *Husbandry*. Barley was sown at five to six bushels an acre on the Priory estates in Kent and Surrey, and at three, three-and-a-half or four bushels an acre on its estates elsewhere. Oats were sown at a wider variety of rates, but still with

higher rates prevailing throughout much of Kent. On the Christ Church estates there oats were sown at eight bushels per acre on the Romney Marsh manors, six to seven bushels on the east Kent and Medway valley manors, and four to five bushels on its two northern manors of Meopham and Orpington. In contrast, on most of its Essex and Suffolk manors, two-and-a-half or three bushels per acre were sown, but at Milton and Hadleigh four bushels were used. Its Surrey manors sowed oats at five bushels an acre, the same rate as on the Archbishop of Canterbury's Surrey manors.²² Some of this variation can probably best be explained by differences in soil type, but the prevalence of high or low seeding rates within an area is quite obvious. Oats were also sown at six bushels an acre on the Battle Abbey manor of Marley in the late fourteenth century and when Arthur Young visited the area four centuries later he commented on the heavy sowing he found. One cannot but agree with the observation of Professor Eleanor Searle that 'locally such heavy sowing was probably the custom'.²³

High rates of seed generally produced high yields per acre. With the poor quality of most medieval beasts and tools, it was hard to break up the soil sufficiently to eliminate all the weeds. Over and over again local officials report that more was spent on weeding or the harvests were poor because of an abundance of thistle, or poppy, or noxious herbs. Thus, especially in the Spring, when all vegetation tends to grow more rapidly and vigorously in the wet ground, it made good sense to cover the land with a heavy sowing, so as to fill up the ground with desirable, rather than undesirable plants.²⁴ On demesne land in eastern

¹⁹ A series of 41 accounts. CALC Beadle's rolls, Meopham.

²⁰ c 58 *Walter of Henley*, ed. Oschinsky, pp 442-3.

²¹ P F Brandon, 'Cereal Yields on the Sussex Estates of Battle Abbey during the Later Middle Ages', *Econ Hist Rev*, 2nd ser, XXV, 1972, Table 2, p 408.

²² Lambeth Palace Library ED 831: British Library Addit. MS 29,794 fo 1.

²³ Searle, *Lordship and Community*, p 287.

²⁴ These ideas are more fully developed by W Harwood Long, 'The Low Yields of Corn in Medieval England', *Econ Hist Rev*, 2nd ser, XXXII, 1979, pp 459-69. He is convinced that low yields were not the result of soil exhaustion, but rather the fault of poor farming techniques, which were not adequate to clear the land of weeds.

TABLE I

A Comparison of Seed and Yield Ratios, 1300-1348 on Some Estates of Christ Church Priory

Manor	Seeding rate (bushels)	Average yield per seed	Average yield per acre (bushels)	Available after seed (bushels) if 100 acres sown
<i>Wheat</i>				
Eleigh	2½	3.50	8.75	625
Adisham	4	3.50	14.00	1000
<i>Oats</i>				
Bocking	2½	2.37	5.92	342
Eleigh	3½	2.53	8.85	535
Milton	4	2.69	10.76	676
Ebony	8	2.75	22	1400

Norfolk, in the first half of the fourteenth century, wheat, sown at four bushels per acre, yielded an average of fifteen bushels per acre and on the most productive estates reached thirty bushels or more in a good year.²⁵ On the Sussex estates of Battle Abbey, in the late fourteenth century, the average net yields for wheat, after allowance for tithe and reaping had been subtracted, ranged from nine to just over thirteen bushels an acre.²⁶ Average oat yields ranged from eleven to sixteen bushels per acre, depending on the manor. Similar average yields can be found on the Kentish estates of Christ Church Priory, but, when the new marsh at Appledore was first brought into cultivation in the 1350, oats, seeded at eight bushels per acre, produced harvests of thirty-three and thirty-four bushels an acre.²⁷ Even though a large quantity of grain was required for seed, there was still plenty left over for sale and other purposes. When some Christ Church manors that employed low seed-rates are compared with the higher

seeding ones, the greater profitability of the larger seed-ratio becomes apparent.

Whatever differences may have existed in the size of the bushels,²⁸ the amount of oats available at Ebony in Kent was far greater than that available at Bocking in Essex.

Were Priory officials aware of the advantages of sowing more intensively? They never made the exact calculation made above. But when they did calculate yields, it was usually done on a 'per acre' basis. They should, therefore, have realized that more was being produced on each acre in Kent than Essex, yet they made no effort to increase seeding rates outside Kent. The books of husbandry, however, in discussing yields focused on the yield per seed, not the yield per acre. Walter of Henley pointed out that if the grain did not yield three times as much as the seed, the farmer gained nothing unless the corn bore a good price. The author of the *Husbandry* believed that, by rights, 'barley ought to yield to the eighth grain . . . wheat ought to yield to the fifth

²⁵ Campbell, 'Regional Uniqueness', p. 21: see also Campbell, 'Agricultural Progress', p. 31.

²⁶ Brandon, 'Cereal Yields', p. 417.

²⁷ CALC Beadle's rolls, Appledore, 1353-4.

²⁸ In the early fourteenth century the Kentish measure for oats was the large seam, which contained sixteen bushels, and it is not clear whether these bushels were the same size as those in a quarter or eight-bushel seam. But when the Priory switched over to using the standard measure of the quarter, it still seeded at the same rate of bushels, which suggests that the bushel was the same size.

grain and oats to the fourth grain'.²⁹ On the Christ Church estates the yields per seed, as Table 1 indicates, were frequently the same inside and outside Kent. The monks may have thought that their crops were producing as much as could be expected. Moreover the seeding rates used at Bocking (2½ bushels per acre for both wheat and oats) can be found on other estates in northern Essex.³⁰ If, according to the wisdom of the neighbourhood, such rates were best suited to local soils, why should the monks make any changes?

The books of husbandry were also silent about the fertilizing properties of legumes. Yet in many parts of the country substantial amounts of legumes were being grown. On the manors of Isabella de Forz in the Isle of Wight between 16 and 23 per cent of the total acreage was sown with peas, and vetch and beans covered a considerable acreage on some of her lands in Holderness. When these manors came into royal hands, the sowing of legumes continued on the Isle of Wight and increased in Holderness. At Brustwick, for example, before the 1330s, 95½ acres on an average were planted with oats and 28 acres with beans and peas. Thereafter the area under oats steadily declined and, concomitantly, the area under legumes increased until in the early 1340s 14½ acres were being sown with oats and 133 acres with legumes.³¹ In east Kent and coastal Sussex many lords sowed a quarter to a third of their total acreage with legumes and these crops were generally not grown at the expense of the Spring crop, but were an alternative to fallow. The value of such practices shows up very clearly in eastern Norfolk, where those demesnes which cultivated above-average

quantities of legumes sustained above-average levels of productivity.³²

Did medieval farmers, however, know that legumes added nitrogen to the soil and sow them in order to enrich the land? Vetch or peas also provided useful forage for animals, and on the estates of Canterbury Cathedral Priory were almost always consumed in the fields by the beasts, usually the carthorses or the stots. Indeed on some manors, none of the crop was saved for seed, and the serjeant spent £4 or £5 a year purchasing new legume seed. Yet this expenditure was presumably worth it, since it allowed him to reduce the area under oats, which would otherwise be needed for forage, in favour of barley that was needed to make ale for the house. Thus the main purpose behind the large sowing of legumes on the Priory's east Kent estates may not have been to improve the quality of the soil, but simply to provide sustenance for the stock. For the Christ Church monks, on their Essex manors, sowed between 2 and 5 per cent of the total acreage with legumes. On their Suffolk and Surrey manors the percentage was somewhat higher, 5 to 10 per cent, but still below the 25 per cent so common on their east Kent manors. Since legumes were so useful, both in enriching the soil and providing needed forage, why did the Priory not increase the acreage under legumes outside Kent? One reason may have been that the average yield per seed on these manors was already on a level with those in Kent, just over three times the seed with wheat and two-and-a-half times with oats. As was suggested for seeding rates, Priory officials may have believed that the land was already producing to capacity. On the other hand they may have been totally unaware that legumes added to the fertility of the soil, especially since the books of husbandry did not mention it. Crops were often sown to supply a specific need, whether it was food for the animals, for the *famuli* or the

²⁹ Walter of Henley c 59; Husbandry c 3. *Walter of Henley*, ed. Oschinsky, pp 324-5, 418-9.

³⁰ R H Britnell, 'Agricultural Technology and the Margin of Cultivation in the Fourteenth Century', *Econ Hist Rev*, 2nd ser, XXX, 1977, p 60.

³¹ M Mate, 'Profit and Productivity on the Estates of Isabella de Forz, 1260-92', *Econ Hist Rev*, 2nd ser, XXXIII, 1980, pp 331-3; PRO SC6/1079/12 m. 12: 1080/9 m. 8d., 11d., 14d., 18d.: 1082/4 m. 1: 1082/5 m. 3.

³² Campbell, 'Agricultural Progress', p 32.

TABLE 2
Cropping pattern of Wellesfield, 1309-1318³⁴

<i>Years</i>	<i>Crops sown in acres</i>	<i>Total acreage sown</i>
1309	fallow	0
1310	13 wheat, 39 barley, 18 peas, 12 vetch, 33 oats	115
1311	34 vetch	34
1314	36 wheat, 6½ winter barley, 8 spring barley, 30 peas, 33 vetch	113½
1315	54 wheat, 9 winter barley, 25 spring barley, 16 oats	104
1316	18 spring barley, 6 peas, 2 vetch, 50 oats	76
1317	35½ wheat, 13 peas, 13 vetch, 22 oats	83½
1318	fallow	0

household. The more distant estates of the Priory were not expected to supply the house with barley, so local officials could take care of the needs of the stock by planting a substantial acreage under oats. Furthermore other north Essex lords, in the first half of the fourteenth century, were also sowing primarily wheat and oats. Even so, what was to prevent the monks from introducing the east Kent rotation system — wheat/barley plus oats/legumes or fallow — on their estates in Essex and selling the barley locally, like they did their wheat? Land in that area was clearly suitable for barley, since it was grown there successfully in the fifteenth century.³³ Again one can only hazard a guess. The market for barley may not have been as developed in the fourteenth century as it became later. Moreover since farmers in the neighbourhood clearly felt that the land was best suited for the growing of wheat and oats, and nothing else, the monks of Christ Church may have decided not to challenge that local wisdom.

Cropping patterns also varied a great deal from one part of the country to the next. In Kent it was quite common to scatter the main crop over a wide area and not sow it all in one field. On the manors of Canterbury Cathedral Priory the large demesne fields were frequently sown with more than one kind of crop in a field in any given year,

including a mixture of winter and spring grains. A clear example is the use of Wellesfield in the manor of Welles. Where the fields were slightly smaller, it was customary to sow one main crop, plus a small admixture of different grains. The field before the gate at Loose, for example, was sown, in 1311, with thirty-five acres of wheat, four acres of rye, three acres of vetch and one acre of peas, and in 1320, with three acres of oats and thirty-nine acres of wheat. As elsewhere, the whole field was not sown every year and when just legumes were sown, two-thirds of the land was usually planted and the rest was left fallow.

All the evidence indicates this scattering of crops was practised on other Kentish estates as well. Writing of Otford, one of the manors of the Archbishop of Canterbury, Du Boulay says, 'The most striking fact is the way in which the larger fields were themselves divided among the different crops in any one year and also were liable to have only a small proportion of their area cropped in any particular year.'³⁵ Less evidence is available for what was done on tenant land, but there appears to have been no common rotation system and each individual was free to plant whatever he wished on any of his strips. Thus even when

³³ Britnell, 'Agricultural Technology', pp 58-64.

³⁴ CALC Beadle's rolls, Welles.

³⁵ F R H Du Boulay, 'Late continued demesne farming at Otford', *Archaeologia Cantiana*, LXXVII, 1959, p 120. See also *The Lordship of Canterbury*, 1966, p 48.

demesne land was mixed in with tenant land, there was no obligation to plant the same crops as one's neighbour. As Christ Church Priory picked up more and more tenant land, it sought to consolidate its holdings, purchasing the land of its neighbours and exchanging parcels in one field for another. Where it was not possible, however, the convent might well be left with a parcel of a few acres at the edge of a field or surrounded by tenant land. In such a case, there would be no reason why the local serjeant should not sow a different crop there from the main crop sown in a larger parcel in a different part of the field.

But scattering appears to have had advantages in and of itself and cannot be explained solely in terms of the wide dispersion of demesne land. At Welles, between 1314 and 1318, an average of 83 acres of wheat was sown a year. They could easily have all been sown in Wellesfield. They never were. Instead they were always scattered among two or three fields. The most logical explanation is the idea put forward by Professor Donald McCloskey that scattering reduced the risk of having all one's crops destroyed.³⁶ Both fungoid diseases and insect attacks tended to be spotty in their incidence. Other risks — flood, fire, birds, rabbits, moles, hail and wandering armies — could all attack one field and leave its neighbour unmolested. One way to reduce the risk of total loss was to scatter crops over different locations. Another advantage of scattering was great flexibility. Acreages under the different grains were not tied to a fixed field system and could be changed easily from year to year.

Scattering can be found outside of Kent. The author of the *Husbandry* recognized that

winter and summer corn might be sown in the same field, for he advised the reeve, when that happened, to account for each furlong separately.³⁷ In some parts of Yorkshire cropping patterns approximated those of Kent. On the royal manor of Brustwick, for example, in 1344, the Eastfield was sown with 65 acres of wheat, 2½ acres of rye, 30 acres of barley and 34 acres were left to lie waste.³⁸ On the Dorset lands of Glastonbury Abbey, the greater part of a field was sown with one main crop, such as wheat, but a few small patches were sown with oats and barley.³⁹ Elsewhere sown fields frequently contained some fallow land and it was quite common to bunch together different crops of the same season. On the Christ Church Essex estates, however, such practices rarely occurred. The monks, on their fields there, never sowed a mixture of winter and spring grains and, in general, fully utilized each main field each time around.

In Kent, Sussex, and Norfolk as well as in Flanders, some form of convertible husbandry was practised. The plough was taken round the pasture for the express purpose of improving the pasture, and not to increase the area under cultivation.⁴⁰ Instead of the land being divided into permanent grass and permanent arable, pasture and arable became almost interchangeable. On the Christ Church Kentish manor of Mersham, for example, the main demesne fields were frequently listed in the pasture accounts with the notation 'nothing because sown this year'. Some patches of land there continuously switched back and forth. In 1289 the pasture of Rydale was sold for 9s 6d and in 1290 it was sown with twelve acres of oats. Then it reverted to pasture. In the late 1330s,

³⁷ c 60, *Walter of Henley*, ed. Oschinsky, p 443.

³⁸ PRO SC6/1082/5 m. 3.

³⁹ I Keil, 'Farming on the Dorset estates of Glastonbury Abbey', *Proc Dorset Natural History and Archaeology Soc*, LXXVII, 1965, p 239.

⁴⁰ P F Brandon, 'Demesne Arable Farming in Coastal Sussex during the later Middle Ages', *Ag Hist Rev*, XIX, 2, 1969, pp 132-4; Searle, *Lordship and Community*, pp 272-86; Campbell, 'Agricultural Progress', p 43; for practices in Flanders and Brabant see Marie-Jeanne Tits-Dieuaide, 'L'évolution des techniques agricoles en Flandre et en Brabant du xiv^e au xvi^e siècle', *Annales, Et Soc Civ*, May-June 1981, p 372.

³⁶ D McCloskey, 'The persistence of the English open fields' in W N Parker and E C Jones, eds, *European Peasants and their Markets* (Princeton, 1975) and 'English Open Fields as a Behaviour towards Risk' in *Research in Economic History*, I, 1976. Charles Wilson in 'A Letter to Professor McCloskey' asks why the lords failed to notice the risk aversion benefits that were open to them by scattering (*Journal of European Economic History* 8, 1979), but clearly some lords were aware of these benefits.

however, it was being sown heavily with wheat in 1337, 1339 and 1343 but after the Black Death it returned to being pasture and sold for 15s in 1350. This practice of improving pasture through cultivation may well have been followed by the peasants as well as the lords, for when, in 1299, the Priory drew up a list of acres that had been sown on the manor of Westcliff, it specifically noted that 'twenty acres of weak pasture had been sown with oats to improve the pasture *according to the custom of the neighbourhood*' [italics mine].⁴¹ This occasional ploughing under of the pasture helped to prevent the grass from becoming waterlogged and allowed crops to be sown on ground that had been well-manured for long periods of time. In many other parts of the country poor land, used primarily for pasture, was sown with oats occasionally, but not on a regular basis, as was usual with full-fledged convertible husbandry.

Some of these variations in agrarian practices can be explained by differences in soil fertility. Where land was particularly fertile, such as in coastal Sussex and eastern Norfolk, lords were able to crop it with considerable intensity. The monks of Battle Abbey, by using high seeding rates to smother the weeds and sowing 20 to 30 per cent of the total acreage with legumes, were able to reduce or eliminate the fallow on many of their estates in the late Middle Ages and still produce harvests that were superior to those on the estates of the Bishop of Winchester.⁴² Their lay neighbours pursued similar policies. In eastern Norfolk, land, in the first half of the fourteenth century, was often left fallow only once every ten or twelve years and still produced good yields.⁴³ Conversely when lords tried to grow wheat on poor land, they were often forced to leave it fallow for long periods of time. On the Christ Church marsh manor of

Ebony the most usual rotation for a wheat field was wheat/fallow/fallow/legume. Just once in a while would they be sown with oats. Similarly on its Medway valley manor of Great Chart many of the small wheat fields were sown only occasionally with oats and left fallow more times than they were sown. Even poor land that had been marled could not be cultivated for a sustained period. Twenty-six acres at Great Chart, called Roughwood, were marled in 1311 and sown with wheat in 1313. Thereafter there are only two references in 1321 and 1325 when they were sown with oats. The land appears to have reverted to grass. Even the main field, Westfield, which followed a fairly regular three course rotation, could not be cultivated indefinitely. In the early fourteenth century around eighty acres were sown most years; by the 1340s just over half that amount was sown and by the 1360s and 1370s Westfield was virtually abandoned and just used for growing occasional vetch and peas. In its place the serjeant was using areas for wheat that had not been cultivated earlier. In the Chiltern Hills, some fields followed a path similar to that of the fields of Great Chart, ie, they were ploughed regularly before the 1330s, then cropped intermittently and finally abandoned.⁴⁴

III

When landlords, like the monks of Battle Abbey and Christ Church Priory, had manors in different parts of the country, they made no distinction between their estates in matters such as manuring and marling. Furthermore stock-raising, on the Christ Church estates, was carried out with the same care in Essex as in Kent. In contrast, practices such as seeding rates, the use of legumes and the widespread scattering of crops varied on the manors in different parts of the country. Within Kent, Christ Church Priory managed its estates with remarkable

⁴¹ CALC Register I, fos. 144v.-145v.

⁴² Brandon, 'Demesne Arable Farming', pp 113-34; Brandon, 'Cereal Yields', pp 403-20.

⁴³ Campbell, 'Regional Uniqueness', p 21; 'Agricultural Progress', p 43.

⁴⁴ Roden, 'Demesne Farming', pp 20-21.

efficiency. By using legumes for fodder, it cut back the area under oats in east Kent and replaced it with barley. It minimized the risk of loss through disease and other hazards by scattering the crops over different locations and it sowed at a high rate of seed. It also maintained its pasture in good shape with regular ploughing, and where poor land was sown with wheat, the Priory was content to let it lie fallow for long periods of time. Outside Kent, it did not follow similar policies. Large quantities of oats were grown to feed the stock. Little attempt was made to scatter the crops and seed was sown at a lower rate. Consequently although the basic fertility of the soil was approximately the same, the returns available for the Priory were less. Yet it was never acting in isolation. The policies it pursued so successfully in Kent were also followed on the Kentish estates of Battle Abbey, on the archiepiscopal estates and as far as can be ascertained on the lands of the peasants themselves. Similarly in northern Essex the low seeding rates and lack of legumes can be found on the Bouchier estates.

What lay behind these marked differences in practice? The areas in which farmers generally used a high seeding rate and high percentage of legumes were all strung round the east and south coasts of England — Holderness, Huntingdonshire and parts of Cambridgeshire, eastern Norfolk, northern

and eastern Kent and coastal Sussex. As B M S Campbell has pointed out, they 'all possessed naturally fertile and easily cultivated soils, all enjoyed coastal and/or riverine access to major urban markets, both at home and overseas, and all supported above-average population densities'.⁴⁵ But can this be a sufficient explanation? Certainly on the Christ Church estates the fertility of many of its Essex and Suffolk manors was as great as those in east Kent. Moreover Milton, on the south Essex coast, had easy access to London, and successfully utilized this advantage in the marketing of its stock. Yet very few legumes were grown there.⁴⁶ The best explanation, to my mind, is that most landlords did not realize that sowing at a higher rate of seed would produce higher yields per acre or that legumes fertilized the soil. Here the silence of the books of husbandry is surely significant. The techniques advocated by Walter of Henley and others — manuring, marling and folding sheep — were applied uniformly. Where no advice was given, lords seem to have relied on what can best be described as the local wisdom of the neighbourhood, in deciding what crops to grow and at what rate to sow seed. That wisdom naturally varied from one part of the country to another.

⁴⁵ Campbell, 'Agricultural Progress', p 43.

⁴⁶ 3-5 per cent in the late thirteenth and early fourteenth century, CALC Beadle's rolls, Milton.