

Clays, *Culturae*, and The Cultivator's Wisdom: Management Efficiency at Fourteenth- Century Wistow

By M PATRICIA HOGAN

It is best to do things systematically, since we are only human, and disorder is our worst enemy. (Hesiod, *Works and Days*, II. 471-72)

Abstract

This is a study of the decision-making process pertaining to the forty-eight demesne furlongs at Wistow, Hunts. Economically, the manor has been regarded as typical of the almost seventy properties comprising Ramsey Abbey. A useful sequence of account rolls for the 1380s-1390s, a detailed list of the furlongs in a manorial inquest of 1252, and a pre-enclosure estate map of 1617 furnish the chief documentation. Quite exceptionally, the *compoti* indicate sowing patterns parcel by parcel. Hence, the author has been able to trace decision-making with respect to the seeding, rotation, sub-division, and resting of the individual furlongs, and the yields which these choices did and did not facilitate. The analysis brings greater precision, detail, and integration to the topic of cropping strategy.

INVESTIGATIONS of the agrarian economy of medieval England are increasingly pointing to the considerable diversity in production strategy. Geographers, archaeologists, topographers, and historians alike have noted various peculiarities with respect to the furlong, rood, and acre, and indeed the uniqueness of field systems generally.¹ Similarly, P F Brandon, Bruce Campbell and R H Britnell, among others, have detected a range of interest in the technological and labour inputs of crop choices, sowing rates, weeding, folding, marling, liming, drainage measures, and convertible

husbandry.² Beneath this panoply of influential factors, however, lies a yet more fundamental consideration. What was basic decision-making with respect to the *culturae*? How were the many cropping units devised, reviewed and if necessary resuscitated, and generally integrated into a balanced and otherwise effective system of husbandry? These complexities and their resolution pre-eminently reflect the 'efficiency of management' and as Bruce Campbell notes, the outcome was not only capable of moderating environmental disadvantages, but would have had a significant impact on remaining technological

¹ For recent reconstitutions of fields, see Cecily Howell, *Land, Family and Inheritance in Transition, Kibworth Harcourt 1280-1700*, Cambridge, 1983, pp. 78-94 95-113, 147-54; David Hall, *Medieval Fields*, Aylesbury, Bucks, 1982; C P Hall and J R Ravensdale, *The West Fields of Cambridge*, Cambridge, 1976; Trevor Rowley, 'Medieval Field Systems' in Leonard Cantor (ed) *The English Medieval Landscape*, 1982, pp. 22-55; Victor Skipp, 'The Evolution of Settlement and Open-Field Topography in North Arden down to 1300' in Trevor Rowley ed. *The Origins of Open-Field Agriculture*, 1981, pp 162-83.

² P F Brandon, 'Cereal Yields on the Sussex Estates of Battle Abbey during the Later Middle Ages', *Econ Hist Rev*, 2nd ser, XXV 1972, 402-20; Bruce M S Campbell, 'Agricultural Progress in Medieval England: Some Evidence From Eastern Norfolk', *Econ Hist Rev*, 2nd ser, XXXVII, 1983, 26-46; R H Britnell, 'Agricultural Technology and the Margin of Cultivation in the Fourteenth Century', *Econ Hist Rev*, 2nd ser XXX, 1977, 53-66; Eleanor Searle, *Lordship and Community: Battle Abbey and Its Banlieu 1066-1538*, Toronto, 1974, esp pp 272-92 (Marley); W Harwood Long, 'The Low Yields of Corn in Medieval England', *Econ Hist Rev*, 2nd ser, XXXII, 1979, 459-69, furnishes a general list of the technological factors to be examined.

initiatives.³ The following study attempts to explore this cornerstone of the production system.

I

Amongst the hundreds of manors comprising the medieval English countryside were those of Ramsey Abbey in the East Midlands, almost seventy properties extending over eight counties.⁴ One of these villas, which Nellie Neilson regarded as typifying production on the abbey's estates in the thirteenth and fourteenth centuries, was Wistow in north-eastern Huntingdonshire,⁵ a manor owing a Lenten farm of 2502 bushels of grain⁶ and for which several striking perspectives on its fields survive. To begin with, their number, location, size, names and basic site peculiarities are readily ascertainable from an early seventeenth-century estate map (1617).⁷ A manorial inquest for 1252 provides the first listing of the demesne *culturae*,⁸ and the rich nomenclature together with the detailed seventeenth-century map – sixteen chains to the inch with careful notation of all major landmarks – makes reasonably precise identification of the parcels possible. By the later fourteenth century, Wistow reeves were reckoning seed provisions precisely in terms of the furlong, a quite exceptional practice in estate accounting, and henceforth the survival of a sequence or sequences of rolls, such as, for 1388–89–1390 and for 1393–94–1395, present us with nothing less than the major design and

execution features of the production programme.⁹ Crop preferences and their rationale, the selection and use of each furlong, and yields, the definitive judgement on these decisions and risks, are all explicit in the data.

Beginning with the basic contours of the land, the various thirteenth-century surveys identify an arable area of 1455 acres, 480 in demesne and 975 in villeinage.¹⁰ The demesne actually consisted of forty-eight furlongs arranged in terms of three and eventually four fields (Fig 1). Berrie Woode (Burywood) lay north-east of the village, a 450-acre almost squarish-shaped plot with its name and inclines fittingly recalling its original forest nature. Its western margin generously flanks the water course.¹¹ Rookes Grove to the north-west was again extensively hewn from woodlands: crescent-shaped and resting on a north-south axis, it approached 340 acres with its inner or concave border closely pursuing the south bank of Wistow brook. Milne Hill dominated southern vistas, a large hilly plateau, 400 acres in extent and fifty feet in elevation that virtually screens the village; the road from Huntingdon carves its way through it and a windmill has been located in the field since at least 1252.¹² Lowe Field lay sharply eastward, a small envelope-like plot of 100 to 110 acres springing upward from the water course. Its name seems to have derived from OE *hlaw*, *hlāew*, 'hill',¹³ and additional site features, especially seventeenth-century references to stony lands,

³ 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Jnl Econ Hist*, XLIII, 1983, p 400.

⁴ J Ambrose Raftis, *The Estates of Ramsey Abbey: A Study in Economic Growth and Organization*, Toronto, 1957, pp 13–21.

⁵ Nellie Neilson, *Economic Conditions on the Manors of Ramsey Abbey*, Philadelphia, 1899.

⁶ Raftis, *Estates*, p 181.

⁷ BRA 521, Huntingdonshire County Records Office. Also helpful are the Enclosure Map of 1852, CUL, and the Ordnance Survey, Sheet TL 28 SE, Chessington, Surrey, 1959, the latter indicating land contours and heights above sea level in particular.

⁸ W H Hart and P A Lyons ed *Cartularium Monasterii de Rameseia*, I 1893, p 353. [Hereafter, *Caris*]

⁹ *Compoti* for 1368–1395 are: Public Record Office, Series SC. 6, Portfolio 885, no. 33 (1368); British Library Additional Rolls 39900 (1379), 39901 (1388–89), 39902 (1389–90), 39903 (1393–94), 39904 (1394–95).

¹⁰ *Caris*, I, 353; *Rotuli Hundredorum tempore Henrici III et Edwardi I*, W Illingworth and J Caley (ed), 1818, III, 602.

¹¹ The brook arises in Abbots Ripton and virtually dissects the vill as it winds its way towards Ramsey and the Fen drainage system. Granville Proby and William Page (ed), *The Victoria County History of Huntingdonshire*, 1926, II, 247. [Hereafter *VCH: Hunts*]

¹² *Caris*, I, 354. *VCH: Hunts*, II, 247.

¹³ A Mawer, (ed), *The Chief Elements used in English Place-Names*, EPNS, I, pt 2, Cambridge, 1930, pp 36–37; A H Smith, *English Place-Name Elements*, EPNS, XXV, Cambridge, 1970, pp 248–49.

strongly suggest its status as an outfield¹⁴ (Fig 2).

The inquest of 1252 appears to identify the forty-eight demesne *culturae* directly as the surveyor met them in the field. To note only the listing for Burywood, he began in the south-western corner with the parcels abutting the Bridge and the Lowewey and their several neighbours – Clayhille, Pydehille, *et al.* – immediately inland. Moving north-west identifying a number of meadowside plots, he eventually plunged into the interior acres to re-emerge at Kelneweye (likely Killow Balkes of 1617) in the distant north-east.¹⁵ He completed the inventory and returned homeward via the extreme northern border, nineteen furlongs in all being inscribed.¹⁶ This concreteness of approach certainly furnishes one clue to local production success.

A similar practicality surfaces in the parcel names, many of them reflecting villagers long-standing and well-considered judgement regarding the land. Various contiguous plots in particular, indicate major structural features, soils, irrigation and drainage characteristics, and other principal conditioners of growth. Briefly,

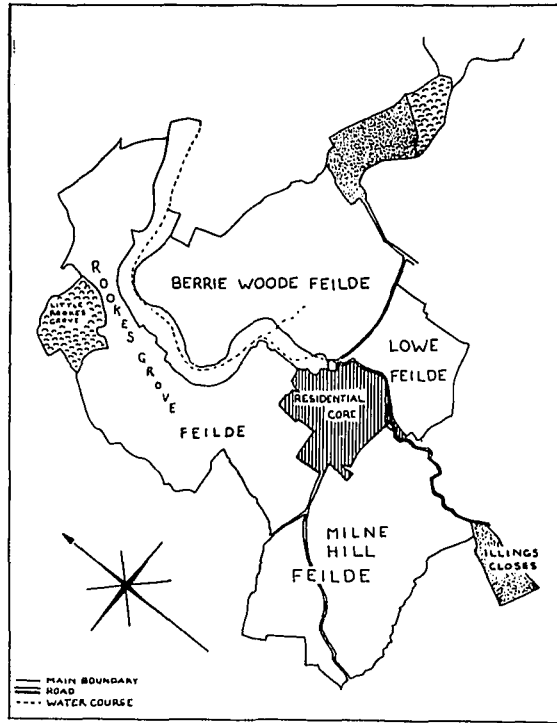


FIGURE 1
The Wistow Fields
(Enclosure Map, 1852)

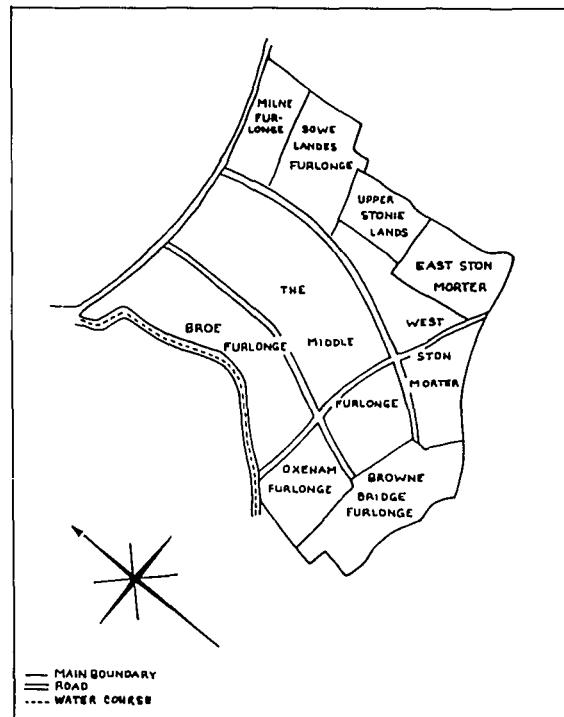


FIGURE 2
The Lowe Field (1617)

¹⁴ Although marginal or outlands were not common on Ramsey estates, the term as Professor Raftis notes is a relative one, geological structures and cultivation practices alike combining to reduce some Huntingdonshire fields to medium pasture ground even today (*Estates*, p 162) T A M Bishop, 'The Rotation of Crops at Westerham 1290-1350', *Econ Hist Rev*, IX, 1938, 38-44 identified a cleared area here of more than 700 acres but found only 120 of these to be permanent arable or infields.

¹⁵ The remains of a kiln site are today located near Shillow where the road from Ramsey to St Ives crosses the parish. Seventeenth-century Killow Balkes is a probable conflation of the words 'kiln' and 'Shillow'.

¹⁶ He then crossed into Rookes Grove (seemingly near present Waterloo Bridge) and beginning in the extreme northern corner moved systematically from the woodside (i.e., inward) *culturae* – Walwardescroft, etc. – to the meadowside plots – Fulbrocufurlange, Ailivemede – finally reaching the southern border, a total of eleven parcels. He entered Milne Hill directly from Rookes Grove, immediately considering the border furlongs to the north-west and then to the north-east, Benefurlange to Hydehave-lande. He finally proceeded through the many inner furlongs – Wysewelle to the Littlehylls – so as to end with the meadowside plots in the southern-eastern corner, fifteen furlongs *in toto*. He noted another two plots, Magnum Stokkyng and Novum Stockyng, which constituted separate closes (outlands) lying north-east of Burywood Field.

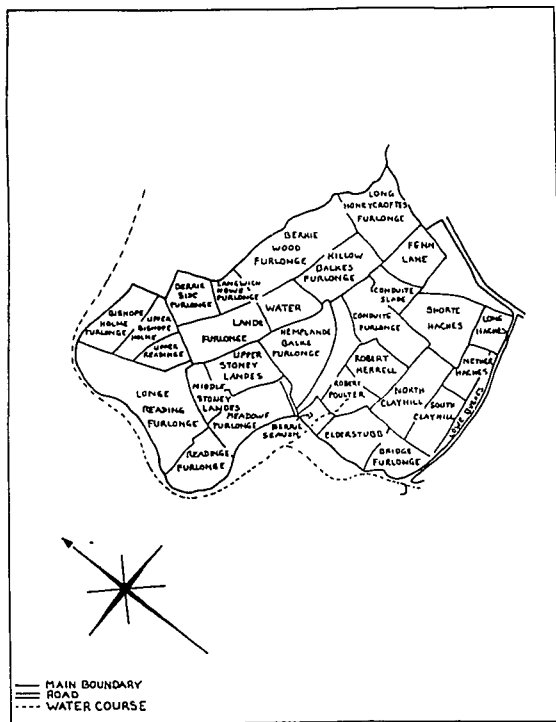


FIGURE 3
Berrie Woode Field (1617)

Briggefurlange, Helrestube¹⁷, Litelelderstube and Alwyslade¹⁸ in southern Burywood together with the meadowside parcels of Brocfurlange, Aldebyre,¹⁹ Hidaldbury and Bissopswange²⁰ further westward, and including Bernewelleshalu, suggest the well-irrigated state of approximately one-third of the field. The three Clayhilles speak more directly of the heavy Oxford clay that is widespread throughout Wistow while adjacent Pydelehille sharpens our sense of the rising contours of the inner field. The two 'stonecrofts'²¹ lying center field also testify to the more challenging dimensions of Burywood, soils

with notable stone deposits, drier lands, and eventual elevations of 100 feet. However, we should by no means exaggerate the difficulties. Kelneweye in the north-east represented the highest ground in the field and indeed the parish, yet, the furnace site alluded to betokens still further the generous and pliable clay soils of the area. There were two brickyards in the parish, this one being closed only towards the end of the nineteenth century.²² In effect, the Oxford clay of Huntingdonshire is estimated to extend to 400 to 600 feet, actual borings have been made to more than 300 feet. The surface boulder clay ranges to at least eighteen feet, with some flint, boulders and occasional beds of gravel. It is well adapted to cultivation, especially to wheat and cereals.²³ (Fig 3).

Although several of the furlongs comprising Rookes Grove reveal woodland origins—Brache, Kyppingscroft, Haselholt—in fact, eight of the eleven noted in 1252 constituted valley land, only twenty feet above sea level and with all the hydrographic and related benefits of such a landscape. The land of Haselholt speaks as well of the loam constituent noted as conspicuous amidst the Wistow clay.²⁴ (Fig 4)

²² VCH: Hunts, II 247.

²³ VCH: Hunts, I, 2, 6-7 characterizes the Oxford clay as *Ammonites cordatus*, i.e., clays with large examples of *Gryphaea dilatata*, also *Ammonites cordatus*, *A. excavatus*, *A. lamberti*, *A. perarmatus*, *Belemnites hastatus*. The boulder clay is an unstratified tough clay with considerable chalk and flint, and erratic boulders. It achieves depths of 70 feet in places. William MacKreath Noble, *Huntingdonshire* in the series *Cambridge County Geographies*, F H H Guillemard (ed) Cambridge, 1911, pp 30-32; D W Fryer, *Huntingdonshire*, part 75 in the series *the Land Utilization Survey of Britain*, L Dudley Stamp (ed), 1941, pp 417-19; G. Maxwell, *General View of the Agriculture of the County of Huntingdon*, 1793, pp 7-15; R Parkinson, *General View of the Agriculture of the County of Huntingdon*, 1811, note that a temperate insular climate with mild winters, average temperatures and sunshine, moderate south-westerly winds and below average precipitation combine with the thick clay soils to constitute prime conditions for the cultivation of beans, peas and cereals. In fact, the Oxford clay high grounds of the south-west in giving way to the peaty and marsh soil lowlands (fenlands) of the north-east tend to promote dampness of the atmosphere which compensates for the low rainfall of less than 22 inches per annum.

²⁴ VCH: Hunts, II, 246.

¹⁷ John Field, *English Field-Names*, Newton Abbot, 1972, p 3 notes of OE *alor* that alders favour a moist and even marshy habitat.

¹⁸ Mawer, *Chief Elements*, p. 53; Smith *English Place-Name Elements*, XXVI, p 127; and Field, *English Field Names*, p 206 describe OE *slæd* as 'low flat valley', 'low flat marshy ground'.

¹⁹ Either Meadows Furlonge or Berrie Seaven of 1617.

²⁰ Bishope Holme of 1617. A Holm meadow is also noted in the 1252 extent. (*Carts*, I 353.)

²¹ Middle and Upper Stoney Landes of 1617.

TABLE I
Demesne Crop Acreages, 1379-94

Year	Wheat	Barley	Legumes	Oats	Total
1379	46a	50a	83½a 1r 5p 4ft	5a	184½ 1r 5p 4ft
1388	47a 22½p	63a 3r 14½p	79a 3r 10p	10a 1r 8p	201a 15p
1389	45a 32½p	60a 3r 3p	78½a 13p	7a ½r 13½p	191½a ½r 22p
1393	47a 1½r 16p	69a 1½ 13p	56a 1r 12p	8a	181a ½r 1p
1394	59a 1½r 4p 15ft	67a 1r 115½p 13ft	69a 3r 14½p	8a	204a 1½r 34p 28ft

rod and eight feet in 1393 – together with their partitioning to allow for mixed cropping, the reconsolidation, and the resting of the plots. The picture emerging from these later details is as follows.

First, the demesne area under seed over the years 1379-1395 ranged from 181⁺ to 204⁺ acres:

Given overall demesne lands of 480 acres, the cultivated sector might seem small; however, by the second half of the fourteenth century, 120 to 140 of these acres were being leased to villagers, leaving approximately 350 of which an anticipated one-third would be at fallow.²⁶

Second, the Lowe Field did not figure in production; all three remaining fields, however, are mentioned conspicuously and consistently in the data.

Third, peas, the important soil improvers and the major protein crop of late medieval farming, certainly dominated the cropping scheme, claiming roughly 40 per cent of the land. They were followed closely by barley (32%), wheat (25%), and oats (4%). The legumes had been increasing steadily from 1297 and there seem to have been three critical reasons for this. Most obviously, they were a corollary of the increased numbers of livestock. Manorial cattle had moved upwards from 51 head in 1252 to 93 in 1319 and hogs from 63 animals in 1247 to 103 in 1351.²⁷ Pulses were prime forage. They were also

an attempt to overcome the very poor oat harvest with its yield (*responsio*) of only 1½ by the early fourteenth century,²⁸ a return that was especially painful because of the extensive planting with them, 50 per cent of all crops over the decades 1250-1290. By contrast, the yield ratio for legumes was 3⁺ to 4½⁻; hence, the seed for them was allowed to rise from 3.6 quarters in 1250 to 34 quarters in 1352 while the oat allowance correspondingly dropped from 99 to 7 quarters. Finally, they were an adjunct of the increased use of barley, being sown subsequent to it,²⁹ and doubtless enhancing the following *fallows*.³⁰ In sum, they were an effort to redeem and render more efficient the entire rotation system.

Barley gave cultivators even more impressive returns. In effect, it could be the second crop in terms of both seed allowance and acreage and still furnish the greatest yields. In 1368, 31 quarters of peas were sown and produced 104.2 quarters of harvested grain; 30 quarters 3 bushels of barley were planted and returned 207 quarters 5 bushels. The *responsio* was always within the range of 4½ to 9 bushels. Wistow reeves were constantly interested in extending the barley area and by 1393 it

²⁶ In 1297, for example, 62.4 quarters of oats sown returned only 93 quarters.

²⁷ See also Raftis, *Estates*, pp 184, n. 15 and 186, n 17.

²⁸ David L Farmer, 'Crop Yields, Prices and Wages in Medieval England', *Stud. in Medieval and Renaissance Hist.*, ns, VI 1983, 133 has suggested that sowing legumes immediately before the fallow served only to nourish the weeds, but it is difficult to see where the pulses might have been more usefully inserted into the schedule. According to Long, 'The Low Yields of Corn', p 463; and Campbell, 'Agricultural Progress', pp 31-32, the land was certainly better for their presence than for the want of them.

²⁶ Compoti frequently describe the rented parcels as *forea*, *placia*, *hydegorn*, and *butte* usually measuring 5 acres or less; the prices paid were 8d to 10d per acre prior to 1368 and 10d to 16d thereafter.

²⁷ Raftis, *Estates*, pp 138, 141-42.

reached to more than 69 acres. This impetus, however, came at the expense of the legumes which fell markedly to 56 acres, a 22-acre decline and a decision that also spelled lower yields for both crops. The barley returned only $4\frac{1}{2}^-$ bushels as compared to 5^+ in 1389, and the legumes yielded only slightly over 1 bushel as compared to $3\frac{1}{2}^-$. As an immediate corrective, the total arable in 1394 was expanded to 204^+ acres from 181^+ acres, allowing for 67^+ acres of barley and 69^+ acres of legumes; it also meant a *responsio* of $4\frac{1}{2}^+$ bushels for barley and 3^+ bushels for pulses.

Wheat was usually sown on 46 to 47 acres over the later fourteenth century and seed quantities for several previous decades suggest an acreage probably double this.³¹ It is its traditional pre-eminence as the important cash crop that explains this respect. Moreover, an attempt to extend the wheat sector was as conspicuous a factor in the arable strategy for 1394 as was the greater sowing of legumes: the area rose by almost a quarter, to 59^+ acres.

By the second half of the fourteenth century the oats here as elsewhere were but a shade of their former selves. Nonetheless, the varying size and rotation of the sector suggest that it was being husbanded no less carefully than was a principal crop. Expanded first from five to ten⁺ acres in 1388, it was then trimmed to seven⁺ and finally stabilized at eight acres for 1393 to 1395.

Crop preferences, however, were only as good as both the seed guarantees and the land use practices identified with them. As already indicated, the quarters and bushels of seed sown are entered in account rolls from an early date, seed-per-acre figures appearing in 1379. Yields obviously provide the major comment on these rates, yet as is well known, in any single account the harvest figures are for the present year

and the seed sown for the next. Fortunately, most of the Wistow rolls contain the reeve's calculations of yield (per seed) for crops planted during the previous year. Otherwise, we must compute these figures assuming that seeding rates remained constant from one year to the next, normally a valid assumption according to several authors.³² Where consecutive rolls are wanting, the yields per acre have been calculated in similar fashion, i.e., assuming that acres sown in any two successive years were constant.³³ The following table aligns as closely as possible these data and reckonings.

The figures are sufficiently impressive. Both *Walter of Henley* and the *Husbandry* advocated sowing rates of 2 to $2\frac{1}{2}$ bushels for wheat, rye, and peas, and 4 bushels for barley, beans, and oats,³⁴ estimates remarkably similar to modern practice.³⁵ Wistow acres were being cropped with $\frac{1}{2}$ to $1\frac{1}{2}$ bushels more seed than these recommendations. The yields per seed also compare favourably with a ratio of three for all grains suggested by *Walter of Henley*,³⁶ exceeding on several occasions the much higher anticipations of the *Husbandry*: 5 for wheat, 8 for barley, 6 for beans and peas, and 4 for oats.³⁷ Returns for the manors of the Bishopric of Winchester compiled by J Z Titow indicate ratios of 3.9 for wheat, 3.6 for barley, and 2.2 for oats over the years 1300-1349.³⁸ Taking wheat alone

³² Campbell, 'Arable Productivity', p 382; Raftis, *Estates*, p 160.

³³ Table 1 challenges this assumption somewhat.

³⁴ Dorothea Oschinsky, *Walter of Henley and Other Treatises on Estate Management and Accounting*, Oxford, 1971, pp 173, 324, 442 *et passim*. For several estates in Eastern Norfolk, Campbell, 'Arable Productivity', pp 387-88 found mean rates of 2.9 bushels for wheat and legumes, 4.9 for barley, and 5.2 for oats. J Z Titow, *Winchester Yields: A Study in Medieval Agricultural Productivity*, Cambridge, 1972, pp 40-42 noted rates of $2\frac{1}{2}$ to 3 bushels for wheat and 4 to 6 for barley and oats.

³⁵ J A S Watson and J A More, *Agriculture: The Science and Practice of British Farming*, 11th ed, Edinburgh, 1962, pp 207, 223, 235; H Jackson and J B Page, 'Seed Rates of Spring Barley and Winter Wheat', *Experimental Husbandry*, II, 1957, 1-11.

³⁶ Oschinsky, *Walter of Henley*, pp 418-19.

³⁷ *Ibid*, pp 324-25.

³⁸ Titow, *Winchester Yields*, p 4. With its 20,000 returns for almost 40 estates, the Winchester collection still provides a benchmark for yield studies. For these same estates over the years 1349-1380, David L Farmer, 'Grain Yields on the Winchester Manors in the Later Middle Ages', *Econ Hist Rev*, 2nd ser., XXX, 1977, 560, notes ratios of 3.66 for wheat, 3.53 for barley and 2.43 for oats.

³¹ The wheat sowing between 1247 and 1368 totalled 31.4 quarters to 41.4 quarters per annum; thereafter it was between 16 and 19 quarters.

TABLE 2
Seed and Yields at Wistow

Year	Seed per Acre	Total Seed	Total Acres	Total Yield	Yield per Seed	Yield per Acre
<i>Wheat</i>						
1368	—	11qr 5bu [?]	—	73qr [?]	6 ⁺	—
1379	(3bu)	17qr 3bu	46	61qr 2bu [sic]	8½ ⁺ [sic]	10.6bu
1388	3bu	18qr 3bu	47 ⁺	97qr 6bu	5 ⁻	16.6bu
1389	3bu	17qr 6bu	45 ⁺	—	—	—
1393	3bu	16qr 1bu	47 ⁺	50qr	4 ⁻	8.5bu
1394	3bu	18qr 1bu	59 ⁺	107qr 8bu	7 ⁺ [?]	18.3bu
<i>Barley</i>						
1368	—	30qr 3bu	—	207qr 5bu	(7 ⁺)	—
1379	(5bu)	31qr 2bu	50	284qr 2bu	9 ⁺	45.4bu
1388	5bu	46qr	63 ⁺	224qr	6½ ⁻	28.4bu
1389	5bu	41qr 1bu	60 ⁺	209qr	5 ⁺	26.5bu
1393	5bu	42qr 3½bu	69 ⁺	150qr 1bu	4½ ⁻	17.4bu
1394	5bu	39qr ½bu	67 ⁺	203qr 3bu	4½ ⁺ [sic]	23.5bu
<i>Legumes</i>						
1368	—	31qr	—	(104qr 2bu)	4½ ⁻	—
1379	—	38qr 7bu	83½ ⁺	40qr 1bu	1½ ⁻	3.8bu
1388	3½bu	37qr 7bu	79 ⁺	109qr 5bu	3 ⁺	11.1bu
1389	3½bu	34qr 7bu	78½	[103qr]	3½ ⁻	[10.4bu]
1393	3½bu	28qr 7½bu	56 ⁺	39qr 3bu [?]	(1)	5.6bu
1394	3½bu	25qr 1bu	69 ⁺	77qr [?]	(3 ⁺)	11bu
<i>Oats</i>						
1368	—	5qr 1bu	—	—	—	—
1379	(5bu)	3qr [?]	5	—	—	—
1388	4bu	4qr 1bu	10 ⁺	—	—	—
1389	4bu	4qr(3bu [?])	7 ⁺	14qr 3bu [?]	1[?]	11.5bu
1393	4bu	4qr	8	—	—	—
1394	4bu	4qr	8	—	—	—

* The bracketed figures are as calculated rather than as given.

** The tithe payment consisted of the harvest of two acres of wheat, one of barley and one of oats (*Carts.*, I, 352). The deduction was made by the reeve *after* his estimation of harvest returns. (Raftis, *Estates*, p. 160, n. 3).

throughout the country, the *responsio* ranged from a depressingly low 2.84 for various estates of Westminster Abbey (1350-1380) to 5.5 quarters for Billingham, a manor of Durham Cathedral Priory (1328-1338).³⁹ Recent research has emphasized both the greater realism and precision

associated with yield per acre figures⁴⁰ and Wistow returns, particularly for the barley, again compare remarkably well, especially with Bruce Campbell's 10.8 to 13.6 bushels for wheat, 14.7 to 15.6 for barley, 12.2 to 13.1 for oats, and 7.2 to 7.5 for legumes for

³⁹ David L Farmer, 'Grain Yields on Westminster Abbey Manors, 1271-1410', *Can Jnl Hist.*, XVIII, 1983, 355, a study which undertakes a very thorough analysis of the factors influencing the yields as well. N Morimoto, 'Arable Farming of Durham Cathedral Priory in the Fourteenth Century', *Nagoya Gakuin University Review*, 2, 1975, 273-74. Only at Little Humber, a holding of the Countess of Aumale, were harvests substantially higher than those noted here, viz., 7.2 for wheat, 9.4 for barley, and 6.8 for beans. See Mavis Mate, 'Profit and Productivity on the Estates of Isabella de Forz (1260-1292)' *Econ Hist Rev*, 2nd ser, XXXIII, 1980, 326-34.

⁴⁰ Campbell, 'Arable Productivity', p 385. Mark Overton 'Estimating Crop Yields from Probate Inventories: An Example from East Anglia, 1585-1735', *Jnl Econ Hist*, XXXIX 1979, 363-78, and more recently 'Agricultural revolution? Development of the agrarian economy in early modern England' in *Explorations in Historical Geography*, Alan R H Baker and Derek Gregory (ed) Cambridge, 1984, esp. pp 128-30 was the first to undertake yield per acre compilations and his work has been a major guide and incentive to medievalists.

an impressive sixty-two manors in eastern Norfolk.⁴¹ These figures in turn surpassed or equalled performance on the most productive demesnes elsewhere.⁴²

III

The reasonably successful Wistow returns focus attention ever more deliberately on the rotation schedule – the judgements regarding the parcels. How precise was knowledge about the abilities of *culturae*? How closely were they being examined for deterioration? How carefully were officials attempting to remedy deficiencies yet also to maintain wider cropping objectives? Or, was planting largely a matter of routine? There is no more satisfying way to explore these questions than simply to witness the production schedule, furlong by furlong, crop by crop, and year by year, *compoti* certainly furnishing a rich cinematic image. Various consistencies and innovations in the agenda announce themselves immediately and we might best proceed from the more conspicuous features to the unique. The individual furlong arrangements in particular, are most aptly assessed in terms of a number of cropping years (demands) and the strength of the parcel relative to each (see Table 3).

Turning first to the overall seeding patterns, they clarify immensely the effective operation of an open-field environment. For any one year, we note a marked tendency to consolidate each sowing: in 1368, for instance, the wheat was concentrated in south-western Burywood; the barley

in the north-western sector of the field stretching to Kelneweye; the legumes in middle Rookes Grove; and the oats in southern Rookes Grove. The juxtaposition of the latter two sectors is interesting, the pulses increasingly being the replacement crop for the oats. Also, the 1368 pattern meant that Milne Hill was entirely at fallow. 1389 found the barley mainly in middle Rookes Grove but extending to North Bendole in the far south field,⁴³ and to the Stockyn, a separate close north-east of Burywood; the wheat centred on southern Rookes Grove but also appeared at Wrongland in the north field; the legumes covered sixteen furlongs of Milne Hill; and the oats occupied 7⁺ acres in central Milne Hill, again near the pulses. The exceptions to a full contiguous sowing were really only North Bendole and the Stockyn sown with barley, and Wrongland cropped with wheat. All three were large and readily accessible plots in border areas, and seemingly invited this flexible use. This 'easiness of access' factor whether associated with a road, a meadow fringe or field boundary explains a number of other sowing discrepancies as well: Netherclayhille cropped with wheat in 1388, and Brigdole, Litel-elderstub, Aldebury and Kelneweye sown with barley in the same year; Elderstub sown with wheat in 1394 and Litelelderstub and Hemplonde beyond it, sown with barley in this year. The reliable clays of Kelneweye may be an additional explanation of its contribution to the barley sowing of 1388. In other words, although open fields were based on scattered strips and an interspersed villeinage and demesne, there were major efforts to overcome the inherent impracticalities of the system. Visually, the sowings must have been quite striking. In 1388, the peas essentially formed a triangle, stretching from south-western Burywood into the mid-field and

⁴¹ Campbell, 'Arable Productivity', p. 388; 'Agricultural Progress', pp. 30–31. As he notes, mean figures often mask wide differences, the demesnes east and north of Norwich showing much higher yields – 20⁺ bushels for wheat – than those to the south-east and south-west.

⁴² *Ibid.*, p. 398. They exceeded returns for the Kentish manors of Canterbury Cathedral Priory, the coastal Sussex estates of Battle Abbey, and the Merton College manor of Cuxham, Oxfordshire, all of which had similarly intensive and flexible rotational schemata and equalled yields for several of the best demesnes of the Countess of Aumale and for Oakington, Cambridgeshire, a manor of Crowland Abbey. See also Farmer, 'Yields on Winchester Manors', p. 565.

⁴³ The Bendole parcel may well have straddled Rookes Grove and Milne Hill, the north and middle sections being in the former field and the south section in the latter.

then absorbing several parcels to the north-west.

There was also tremendous stability in the utilization of the furlongs, a comment itself on the soundness of the cultivation cycle. Only Smethescroftdole, Shoftbrigg, le Stockyn, and le Conyngg',⁴⁴ four of forty-five furlongs, emerge marginally (i.e., once) in the lists. Moreover, there was a tendency to partition furlongs so that they might receive two and even three varieties of seed. Hemplonde was subdivided in 1379; Aldebury, Brigdole, Netherclayhille, and 'supra Lytelhille' furnished examples in 1388; Bendole in 1389; and so forth. These arrangements clearly reflect a very individualized approach to the parcels and also a solid disquisition at the basis of production judgements. It is basic crop priorities - the desire to have 40% of land under legumes, 25% under wheat, etc. - that ultimately explain the strategies. Accordingly, managers tended to weigh the strengths of the furlongs and the debilitating effects of the various crops on them, the resulting arrangements often being quite intriguing.

Hemplonde, for example, in 1379 was divided between wheat and peas and depicts very clearly the decision to reduce the wheat sowing from 37⁺ quarters (1368) to only 17 quarters 3 bushels, while simultaneously increasing the legumes to 38⁺ quarters 7 bushels from 31⁺ quarters. The 20-acre plot would normally have received a full wheat sowing. Fifteen years later, 1394, one-half of Hemplonde was sown with legumes and the other half with barley, and this directly following a full barley sowing. Customarily, it would have received legumes throughout and it is interesting that the peas were actually being increased by more than 13 acres. That the parcel was nonetheless drawn on substantially for the barley is a tribute to its considerable strength. As previously

noted, it lay in mid-Burywood immediately above the three Clayhilles, and with the overall barley yield improving to 23.5 bushels per acre from 17.4 bushels these 10⁺ acres seem indeed to have met the demand made on them.

In analogous fashion, Aldebury, a meadowside parcel in north-western Burywood, and the selions 'supra Lytelhille' in central Milne Hill were cropped to assist the 13-acre barley increase of 1388. The Aldebury initiative was a relatively modest one, 2 acres 10 perches of its 13⁺ acres being earmarked for the barley rather than legumes. From 1388 onwards, the lands 'above Litelhille' were always enrolled as a section of 7 selions (1½⁺ acres) and another of 14 selions (3⁺ acres); in this particular year the smaller unit was sown with wheat and the larger with barley. Since both were due for a wheat course this was not as demanding a cropping change as was imposed on Aldebury, or on Hemplonde in 1394. Nonetheless, the barley planting certainly assisted the further objective of contiguous sowing, the crop consequently being concentrated in middle Milne Hill to the northern border. With a general yield of 28.4 bushels per acre, both subdivisions seem to have been reasonably successful.

Another two *culturae* bore two crops in 1388, Netherclayhille and Brigdole, and with even more interesting implications. The legume-wheat sowing of the former suggests quite simply that the parcel could not sustain the full wheat crop intended, the peas being intercalated as a palliative. The legumes did not increase this year but actually dropped marginally from 79 to 78 acres; moreover, the whole of Netherclayhille was put at fallow in 1389. Its ailing condition, however, proves somewhat curious, the parcel being well-located, immediately behind the meadow furlongs in south-western Burywood and within a conspicuous and extensive clay belt. That the land had been vigorously

⁴⁴ Although Hadlond appears only once, the spelling seems to be a variant of Hidhedlond.

exploited in recent years seems to be the most plausible explanation.⁴⁵ Interestingly, alternative acres were found to preserve the normal 46-47 acre wheat sector. Netherclayhille itself had rebounded to strength by 1393, resuming its traditional place in the rotation cycle. There is indeed considerable likelihood that such parcels received special rehabilitative attention. While *opera* statements for 1379-1394 give only seasonal tallies, manuring services were consistently amongst the 1431 to 1604 works performed in the winter season.⁴⁶ Also, livestock inventories noting as many as 468 demesne sheep, 93 cattle, 122 hogs, and 40 draught beasts would have meant quite generous supplies of manure.⁴⁷

Brigdole was certainly the most diversely exploited parcel at Wistow. Planted with peas in 1379 when they were being increased from 31 quarters (1368) to 38 quarters 7 bushels, it was cropped with barley and peas in 1388 when there was a corresponding effort to increase the barley from 50 acres to 63⁺ acres yet also to maintain the wheat and legumes sowings. In 1393, it was reconsolidated and planted throughout with barley, this sector being further expanded to 69⁺ acres. Being quintessentially a meadow piece (the most meadowside of the *culturae*) the 10½⁺ acres of Brigdole were constantly relied on to assist crop modifications. In 1394, when it should have received a legumes sowing or possibly even a fallow course, wheat was sown over one-quarter of its acres, this crop currently being expanded by 12 acres; peas were sown over half its area as suited

the normal rotation but which also coincided with efforts to increase this course from 56⁺ acres (1393) to 69⁺ acres; and barley was seeded over the remaining one-quarter acres when management was striving to maintain this sector at 67 to 68 acres. Subjected to yeoman service, the furlong again honoured expectations: the wheat ratio rose to 18.5 bushels per acre from the 8.5 bushels of 1393 and the barley to 23.5 bushels from a previous 17.4 bushels, mindful, nonetheless, that the overall cropped land was expanded from 181⁺ to 204⁺ acres.

At over 36 acres Bendole was the largest demesne furlong; it abutted the Huntingdon road and possibly bridged Rookes Grove and Milne Hill fields thus giving easy access and convenience generally for cultivation. Yet it was clearly its fertility that drew the attention of strategists to it. In 1379, the parcel was treated as a single unit and planted with barley. Thereafter, it was conspicuously a tripartite plot consisting of North Bendole (9⁺ acres), Middle Bendole (7½⁺ acres), and South Bendole (19½⁺ acres). In 1388, a banner year for the barley, the entire three sections were sown with this seed. In 1389, when management shrewdly chose to maintain the acreages of the previous year, Bendole was sown with the three major crops: barley in the north, wheat in the middle, and peas in the south. It was unquestionably the excellent yields of 1388 – 16.6 bushels per acre for wheat, 28.4 bushels for barley, and 11.1 bushels for legumes – that led to a re-endorsement of the 1388 schedule. Nonetheless, the triple cropping certainly represented a noteworthy imposition, for following the barley of 1388 the plot ideally should have received pulses. That it supported wheat and barley on almost half its acres and with yields that were again highly satisfactory – 26.5 bushels for the barley – is once more a significant comment on its quality.

In 1393, officials judged Overclayhille, Pidelehill, and Kyppynescroft as capable

⁴⁵ Long 'The Low Yields of Corn', p 463; and M M Postan, *The Medieval Economy and Society*, 1972, p 62, cite inadequate underdrainage as a problem with heavier more fertile soils as well. The slopes of Netherclayhille, however, would seem to have countered this difficulty somewhat. See also, M H R Soper, 'Heavy Land Farming', *Agriculture*, LXVII, 1960, 174-78.

⁴⁶ 1379-80 (1454); 1388-89 (1604); 1389-90 (1506); 1393-94 (1503); 1394-95 (1431). As many as 66 manuring works annually and 77 marling works are noted in account rolls for 1335-1352 (B L Add. Rolls 39895, 39896, 39897 and 39898). Also, 100 to 150 weeding *opera* and 200 to 300 harrowing services went to cleansing and conditioning the land.

⁴⁷ Raftis, *Estates*, pp 132-33; 138-39; 141-42; 149.

of assisting an additional 9-acre expansion of the barley. Yet, they made a further decision that more than offset this initiative. Half of Overclayhille's $9\frac{1}{2}^+$ acres were drawn on for the barley, two-thirds of Pidelehille's $7\frac{1}{2}^+$ acres, and four-fifths of Kypppyngescroft's $11\frac{1}{2}^+$ acres, the remaining soil being sown with wheat which was being retained at its competitive best, 47^+ acres, as well. All three parcels were well-endowed, Pidelehille lying just above Overclayhille and sharing in its rich soil character and Kypppyngescroft lying not too distant from the water course in mid-Rookes Grove. In sum, they were being counted on to nurture the two most demanding crops, but at a time when the overall planted area was also being reduced from 191^+ acres to 181^+ acres. Even more so than Overclayhille or Pidelehille was Kypppyngescroft serving the ambitious agenda. Having supported barley in 1389 it should normally have received legumes in 1393,⁴⁸ but as previously noted it was this particular sector that was being so dramatically trimmed, a full 22 acres. Wheat and barley alone seemed to pre-occupy the farmers of 1393, and ironically both yields fell, the wheat to 8.5 bushels per acre and the barley to 17.4 bushels. Nonetheless, the difficulty lay not with the parcels as such but with the general objectives of cultivators: they were attempting to achieve successful yields in the most highly prized crops and to pursue a notable thrift at the same time. Chapelynsbench seems to confirm these aspirations. It was a parcel often reserved for the oat crop (1368, 1393) and by inference, consisted of poorer land. Hence, when radically reducing the peas, officials decided to seed half this parcel with them they were clearly running a major risk. Their worst expectations were realized: the yield was 1 only or 5.6 bushels per acre.

⁴⁸ 1389-90: barley; 1390-91: legumes; 1391-92: fallow; 1392-93: wheat; 1393-94: legumes.

On balance, the 1393 programme was one of the few miscalculations of Wistow managers, but this should not utterly detract from the vigorous challenge at the heart of it. The formulation of production strategy was an intricate business involving a macro, medium and micro approach to the soil, a consideration of all parcels, the immediately contiguous plots, and the individual unit. It demanded an eye for specifics and for emerging variations. The various *culturae* could yield gains but within limits, especially the limits of past demand. Deliberations were, with but one or two exceptions, notably responsible and notably successful.

IV

Their highly individualized approach to the arable raises the question of the rotation schema generally. Was there any great predictability to it? We may answer this question as follows. Wheat-sown lands tended to be cropped the following year with legumes, but there were exceptions: a 3-acre section of Netherclayhille which had been sown with wheat in 1388-1389 lay fallow in 1389-1390, and a 2 acre section of Kypppyngescroft was similarly treated in 1393-94-1395; meanwhile, the 10 acres 1 rod 8 perches constituting Stocroft which had been sown with wheat in 1393-1394 were reduced to 8 acres and cropped with oats in 1394-1395. The Netherclayhille fallowing, as we have seen, was prefigured in a 1388 legumes half-cropping; in other words, the parcel had been demonstrating fatigue, the fallowing being a yet more radical prescription for it. Perhaps most importantly, the furlong was once more bearing the wheat course in 1393. In the case of Kypppyngescroft, the fallowing was likewise a corrective or at least a reprieve for a parcel which had been cropped with more than its share of wheat and barley, and with seemingly the omission of its

fallow in 1391-1392.⁴⁹ The oats sown at Stocroft were simply the traditional course to follow the wheat and the crop which the peas were increasingly replacing: in effect, the two were equivalents, although the oats were often confined to poorer land.

Barley-sown furlongs were generally subject to one of two programmes in the succeeding year, a course of legumes or a fallow season, and more usually the former. Seven of twelve furlongs sown with barley in 1388 were cropped with legumes (1389); four were given a fallow; and although the twelfth and very large plot of Bendole was subdivided and cropped quite diversely, nonetheless, half of its acres were sown with the anticipated legumes. For 1393-94-1395, the exceptions to a legumes or fallow sequel were far more numerous. In fact, only three of eight *culturae* were subsequently cropped with peas, and only one was given a fallow. The other four parcels – Elderestub, Litelelderstub, Hemplonde, and Brigdole – were dealt with quite unusually. Eldere-stub consisting of 9⁺ acres was sown with wheat. Litelelderstub, a small allotment of 1⁺ acres was cropped again with barley. Hemplonde was precisely halved, 10⁺ acres being sown again with barley and the remainder receiving legumes. Brigdole, a single plot of 10½⁺ acres in 1393-1394, was divided into three, 2½ acres being sown with wheat, 2½ acres with barley, and 5½ acres 5½ perches with legumes. Affording Hemplonde and Brigdole the partial legume sowing was an effort to keep with standard practice. Otherwise, these rotations surpassed all textbook instruction. In effect, we have notable examples of 'inhoking' and there is little suggestion in terms of yields that the exactions were

more than the ground could bear.⁵⁰ Management seems to have balanced quite successfully both needed initiative and caution.

Legume-sown lands were, without exception, allowed to rest the following year as likewise the oat sector. Land destined for a wheat crop was usually resuscitated by a fallow as well. Again, however, there were exceptions: Middle Bendole, sown with wheat in 1389-1390, previously carried a barley crop; Elderestub and a 2½-acre section of Brigdole were handled similarly in 1393-94-1395. Again, we are confronting 'inhoking'.

Ultimately, the evidence presents us with something much more complex than a three-course rotation, yet not strictly illustrative of a standard four-course sequence of winter wheat, spring barley, legumes, and fallow detected by Dr Thirsk for a number of other East Midland communities.⁵¹ Instead, we seem to see the three-course rhythm broken as expedient, with furlongs passing freely from one season to another by the omission or intercalation of a course, or passing out of cultivation altogether for a year or two as need be.⁵² Some of the patterns, especially the omission of the fallow, were partly possible because of the abundant pasturage otherwise, particularly the fen allotment which today reaches to 700 acres.⁵³ In fact, these provisions fostered a very high stocking ratio and in turn generous supplies of manure to abet the fairly intensive cropping scheme. It is the ubiquitous legumes

⁴⁹ Given its barley sowing in 1389, Kyppngescroft should normally have expected legumes in 1390-91, fallow in 1391-92, wheat in 1392-93, and legumes in 1393-94.

⁵⁰ See Joan Thirsk, 'Field Systems of the East Midlands', in *Studies of Field Systems in the British Isles*, A R H Baker and R A Burlin (ed) Cambridge, 1973, p 261 for 'inhokes' in the region; and Campbell, 'Agricultural Progress', p 31.

⁵¹ Thirsk, *op cit*, pp 257-58. See I Beckwith, 'The Remodelling of a Common Field System', *Ag Hist Rev*, 15 1967, 108-12 as well.

⁵² Bishop was one of the first to find such variability in rotations at Westerham. He has been followed by Brandon for Coastal Sussex, Roden for the Chilterns and others.

⁵³ *Carts*, I, 354; *VCH: Hunts*, II, 246. The village also possessed woodland for pannage measuring one league in length and one-half in breadth at the time of Domesday (*VCH: Hunts*, I, 343a; *Carts*, I, 271, 353), and its hamlet of Little Raveley meant a further allotment of fen, woodland, and pasture measuring one-half league in length and one-half in breadth (*Rotuli Hundredorum*, II, 602).

TABLE 3
The Furlong Rotations*

Parcel	1368	1379	1388	1389	1393	1394
Brigdole (S-W B)	—	P	B (2½2a 5½2p) P (8a)	—	B (10½2a 5½2p)	W (2½2a) B (2½2a) P (5½2a 5½2p)
[C]layhille (S-W B)	W	P	—	—	—	—
Netherclayhille (S-W B)	—	—	W (3a) P (3a 1r 10½2p)	—	W (6a 1r 10½2p 4ft)	P (6a 1r 10½2p 4ft)
Overclayhille (S-W B)	—	—	P (9½2a 1r 1p)	—	W (4a 3r 1p) B (4a 3r)	P (9½2a 1r 1p)
Elderestub (S-W B)	W	P	P (9a 1½2r 8p)	—	B (9a 1½2r 8p)	W (9a 1½2r 8p)
Litelelderstub (S-W B)	—	—	B (1a 4p)	—	B (1a 4p)	B (1a 4p)
Stonescroft (Tonestoft, Stocroft) (N-W B, mid-field)	W	O (5a)	O (10a 1r 8p)	—	W (10a 1r 8p 5ft)	O (8a)
Wolstonycroft (N-W B, mid-field)	B	P	P (7a 1r)	—	W (7a 1r 8ft)	P (7a 1r 8ft)
Hemplonde (Mid-B)	B	W P	P (20a 1r 8p)	—	B (20a 1r 8p)	B (10a 1r 8p) P (10a 1r 8p)
Kelneweye (N-E B)	B	P	B (6a 3r 16p)	—	B (6a 3r 16p)	P (6a 3r 16p)
Aldebury (N-W B)	B	P	B (2a 10p) P (11a)	—	W (13a 10p)	P (13a 10p)
Hidaldebury (W to N-W B)	—	—	P (3a 6p)	—	W (3a 6p 5ft)	P (3a 6p 5ft)
Pidelehille (Mid-B)	B	P	P (7½2a 1½2r 16½2p)	—	W (3r) B (6a 3½2r 16½2p)	P (7½2a 1½2r 16½2p)
Kyppyngescroft (Mid-R) (Kipperscroft)	P	—	—	B (11½2a 15p)	B (9½2a 15p) W (2a)	—
Haselholt (Mid-R)	P	—	—	B (17½2a 1½2r 12p)	P (17½2a 3½2r 12p)	—
Aillevmade (Ailemadole) (Mid-R, meadowside)	P	—	—	B (4½2a 1½2r 11½2p)	P (4½2a 1½2r 11½2p)	—
Smethescroftdole (S-R)	P	—	—	—	—	—
Smethescroftthrine (S-R)	O	—	—	W (8a 1½2r 10p)	P (8a 1½2r 10p)	—
<i>supra</i> Smethescroftthrine (S-R)	—	—	—	W (2a 1½2r 18½2p) [11 selions]	P (2a 1½2r 18½2p)	—
Wonglond (Wonglond) (N-E R)	P	—	—	[W (18a 4p)?]	P (18a 4p)	—
Chapelynsbench (S-R [?])	O	—	—	W (8½2a 1½2r 16p)	P (4½2a 1½2r 16p) O (4a)	—
Inlond (S-E M)	—	W	W (26½2a 4p)	P (26a 4p)	—	W (26½2a 4p 3ft)
Shoftbrigg (S-E M)	—	W	—	—	—	—
Stonydole (Stondole) (S-E M?)	—	W	W (4a 1½2r 10p)	P (4a 1½2r 10p)	—	B (4a 1½2r 10p)
<i>supra</i> Lytelhille (Mid-M)	—	W	W (1½2a 1r 11p) [7 selions]	P (1½2a 1r 11p)	—	W (1½2a 1r 11p)
<i>supra</i> Lytelhille (Mid-M)	—	↓	B (3a 1r 9p) [14 selions]	P (3a 1r 9p)	—	W (3a 1r 9p)
Depdole (Depdale) (Mid-M?)	—	W	—	O (7a 1½2r 13½2p)	—	W (7a 1½2r 13½2p)
North Bendole (R-M Border)	—	B	B (9a 1½2r 4½2p)	B (9a 1½2r 4½2p)	—	B (9a 1½2r 4½2p)
Middle Bendole (R-M Border)	—	↓	B (7½2a 4p)	W (7½2a 4p)	—	B (7½2a 4p)
South Bendole (N-W M)	—	↓	B (19½2a 1r 3p)	P (19½2a 1r 3p)	—	B (19½2a 1r 3p 4ft)
Estlong (N-M)	—	B	B (2½2a 1½2r 8½2p)	P (2½2a 1½2r 8½2p)	—	B (2½2a 1½2r 8½2p)
Milledole (N-W M)	—	B	(3a 1½2r 7p)	P (3a 1½2r 7p)	—	W (3a 1½2r 7p 6ft)
Hadlond (N-M?)	—	B	—	—	—	—
Hidhedlond (N-M?)	—	—	B (1½2a 1½2r 2p)	P (1½2a 1½2r 2p)	—	B (1½2a 1½2r 2p)
Coppidheghadlond (S-W M)	—	—	B (½2a 1½2r 7p)	P (½2a 1½2r 7p)	—	B (½2a 1½2r 7p 4ft)
Lytelredlond (N-W M)	—	—	W (2½2a 1r 8p)	P (2½2a 1r 8p)	—	W (2½2a 1r 8p)
Redlondweye (N-W M)	—	—	B (1½2a 1½2r)	P (1½2a 1½2r)	—	B (1½2a 1½2r)
Nomanslond (Mid- to S-E M)	—	—	W (3½2r 6p)	P (3½2r 6p)	—	W (3½2r 6p)
Chesfurlong (<i>supra</i> Chesfurlong) (N-E M)	—	—	W (1a 1½2r 17p) [6 selions]	P (1a 1½2r 17p)	—	W (1a 1½2r 17p 4ft)
Chesbriggdole (N-E M)	—	—	W (4a 1½2r 10½2p)	P (4a 1½2r 10½2p)	—	B (4a 1½2r 10½2p)
<i>supra</i> Chesbrigg (N-E M?)	—	—	W (1½2a 1½2r 16p) [5 selions]	P (1½2a 1½2r 16p)	—	—

TABLE 3

Parcel	1368	1379	1388	1389	1393	1394
Wisewell (mid-M)	—	—	B (1a 14p)	P (1a 14p)	—	B (1a 14p 5ft)
Stockyn (N-E of B)	—	—	—	B(13 1/2a 1/2r)	—	—
(<i>parcellus de Stockyn</i>)						
<i>usque Sabwellesbalke</i>)						
le Conyngg'	—	—	—	—	O (8a)	—

*S-W B = South-Western Burywood; Mid-R = Middle Rookes Grove; R-M Border = Rookes Grove-Milne Hill Border; W-M = West Milne Hill etc.

W = wheat; B = barley; P = peas; O = oats

a = acre; r = rod; p = perch; ft = foot

that possibly warrant the greatest notice: they were an established sequel not simply to the wheat, but to the barley as well, a pattern suggesting a strong appreciation for their nitrogen-fixing and cleansing properties.⁵⁴ In sum, the impression is of a constant interest in planting, of an innovative yet wise use of crops in the interest of both the soil and profits.

V

In conclusion, our various visual and written sources have given us as finely chiselled a glimpse into management decision-making as we are likely to obtain. So much attention centered on the *cultura* – extent lists, sowing *minutiae*, the surveyor's chain; it was the simplest reality yet the principal challenge to the cultivator. Like able tech-

nocrats of any age, demesne officials moved their gaze back and forth between their crop objectives and the various means to fulfil them, the schedule being a living and changing reality. Witness the steady and practical initiatives with respect to new crops, the legumes increase, for example, being a focus from the early 1300s. Consider the efficiency with which they moved to correct the 1393 programme with its inordinate preoccupation with barley and its legumes deficiency. There is also the immediacy with which they re-enacted the 1388 agenda with its very successful yields. Perhaps most strikingly there were the various patterns for dividing parcels and the considerable diversity in the crop sequences. A circumspectness and concreteness characterized these decisions but also a boldness of spirit; these managers showed a notable respect for detail and they were patient. The result was a quite complex and usually profitable cropping system – it was as though an echo of Hesiod were whispering in their ears.

⁵⁴ See also R H Hilton, *The Economic Development of Some Leicestershire Estates in the Fourteenth and Fifteenth Centuries*, Oxford, 1947, pp 63-66, 136 and Appendix III; Brandon, 'Cereal Yields'; Campbell, 'Agricultural Progress', pp 31-32; Farmer, 'Yields on Westminster Abbey Manors', p 341 for examples of increased sowing of legumes.