

Cleaning the Medieval Arable*

By DAVID POSTLES

*Vos blez fetes munder e cercler apres le seint Johan qar devant nest pas bone seson.
Vous poez fere sarcler iii acres de blye pur un dener.¹*

Abstract

Discussion of the productivity of the medieval arable has necessarily concentrated on the margin and limits of technology. The suggestion, recently advanced, that one of the principal determinants of low arable productivity was the poor cleaning of the arable, requires further empirical research. Especially is this necessary, since recent research into arable productivity has emphasized more intensive use of, *inter alia*, labour resources, which resulted in higher output. Such conscious increases of the costs of production may have applied equally in the case of cleaning the arable, both through labour-intensive weeding and the potential use of the *rebinatio* (additional fallow-stirring). An attempt is made here to survey how far such labour inputs were employed.

THESE two pieces of advice by Walter of Henley and the anonymous author of the *Husbandry* impute that hoeing or weeding was a common agrarian practice in the late thirteenth century. In a contribution to the debate about low yields in the middle ages, however, Harwood Long suggested that the weediness of the soil may have been the principal determinant of poor arable results. Furthermore, he maintained that the *rebinatio* – the summer fallow stirring of the demesne – was probably not a widespread practice and may have been impotent in combating the problem of weeds. Nevertheless, Long suggested that it might be difficult to establish the exact nature of these problems because the sources were produced for other purposes. To some extent, his latter argument is correct, but the requisite information can be teased out of the sources – accounts, surveys, even leases and court rolls – with diligence. Sufficient data can be accumulated to make some qualitative

statements about the nature of the cleanliness of the demesne arable, although quantitative assessments are more difficult to make. Even so the effort is worth making, because Long's contention is such a critical one. What follows is an attempt to address the problem of weeding and the *rebinatio* in a speculative survey, using a wide range of original sources. Both weeding of the grain crop and the ploughing of the demesne fallow in the summer relate to the level of the costs of production and the availability of diverse sources of labour. The conclusion reached is that, although weediness may have been a contributory cause of poor yields of grain, efforts were actively made to combat the problem, according to the resources available at different levels on different demesnes. Low yields of grain were multicausal, reflected in different levels of yields from different *pays* or farming regions.²

I

Low yields of grain were predominant in many regions of medieval England, particularly the South, West and Midlands. In

* I owe a great debt to Dr H S A Fox, who raised the question of the *rebinatio* in a paper in 1983, and who has very generously given me unstinting advice. Professor P D A Harvey and Drs B M S Campbell and J A Chartres made helpful comments on a draft. I am sure that I have left many shortcomings for which I alone am responsible.

¹ D Oschinsky (ed), *Walter of Henley and other treatises on estate management and accountancy*, Oxford, 1971, pp 322-3, 442-3, 457.

² W Harwood Long, 'The Low Yields of Corn in Medieval England', *Econ Hist Rev*, 2nd ser. XXXII, 1979, pp 459-69, esp 467-9.



Illustrations of Medieval Weeding

Sources: 1, BL, Royal MS, ZB VII, fo 77v;

2, BL, Add MS, 42130, fo 172.

See also: J Langdon, 'Agricultural Equipment', in G Astill and J A Grant (eds), *The Countryside of Medieval England*, Oxford, 1988, pp 96-7.

some, however, higher average yields were achieved, both through natural attributes and effective estate policy – basically a higher input of the costs of production. In NE Norfolk, on some demesnes of Canterbury Cathedral Priory, of Crowland, and Battle Abbeys, much higher average yields were attained through intensive input of labour, intensive sowing rates, more intensive use of the arable (reduction of fallow, incipient convertible husbandry), and greater production of legumes, all interrelated and providing an improvement in agrarian techniques even if the technology was slow to change.³ Elsewhere, yields were much lower on average. On the Bishop of Winchester's manors at Adderbury and Witney, Oxfordshire, wheat yielded at only 5.68 to 15.92 bushels and 3.44 to 15.12 bushels per measured acre. The highest yields here only approximated to the *average* yields in the more advanced *pays*. Yields at Cuxham, Oxfordshire, ranged from 10.26 to 22.98 bushels of wheat per measured acre. Officials responsible for the demesnes of the Bishop of Winchester in Oxfordshire had a rule of thumb that wheat should yield at six bushels per measured acre (an acre slightly smaller than the statute acre). On these Winchester manors, an allowance of grain was made to some of the *famuli* [permanent estate labourers], who had previously been allowed by custom the issue of one acre. In the late thirteenth century, this allowance was made on the notion of one acre producing six bushels of wheat. The calculation was obviously designed to favour the Bishop, but is still an indicator of the expected yield. Walter of Henley,

probably writing about the same region, also required an acre to produce six bushels of wheat to acquit the costs of production and break even. Demesne husbandry in Oxfordshire seems to have been fairly conservative. By contrast, through improved techniques and practices, productivity elsewhere had increased. The improvement in these other regions had something to do with the cleanliness of the soil through higher labour input, but also much to do with a range of higher costs of production and techniques.⁴

In some manorial accounts, weeding initially occurred amongst the *minute expense* or *expense necessarie*. As accounts became more sophisticated, however, with more precise paragraphs, weeding appeared as a separate paragraph, often with mowing – *sareclacio* (*sarclatura*) *et falcacio* (*falcatura*). The same changes occurred in the accounts of works (customary services). Whereas in some accounts weeding is simply enumerated amongst the summer works, importantly specifying the concentrated time of year for weeding, some more detailed works accounts have separate paragraphs for weeding, such as at Melbourne (Cambs), Wisbech (Cambs) and Launton (Oxon) in the early fourteenth century. These differences and administrative changes reflect the relatively lower costs of weeding compared with some other costs of production. For example, very low costs of weeding can be found at Caversfield (Oxon, Bicester Priory), at 10½d and 4d; at Maids Moreton (Bucks,

³ B M S Campbell, 'Arable Productivity in Medieval England: Some Evidence from Norfolk', *Journal of Econ Hist*, 43, 1983, pp 379–404; M Mate, 'Medieval Agrarian Practices: The Determining Factors', *Ag Hist Rev*, XXXIII, 1985, p 26; F M Page, *The Estates of Crowland Abbey*, Cambridge, 1934, pp 274–6, and H W Saunders (ed), *An Introduction to the Rolls of Norwich Cathedral Priory*, Norwich, 1930, p 11, where the *responsio* for grain is given as yield per acre; P F Brandon, 'Demesne Arable Productivity in Coastal Sussex during the Later Middle Ages', *Ag Hist Rev*, XIX, 1971, pp 130–2.

⁴ J Z Titow, *Winchester Yields*, Cambridge, 1972, pp 88–120; P D A Harvey (ed), *Manorial Records of Cuxham, Oxfordshire, c1200–1359*, Hist MSS Commission, JP23, 1976, pp 733–6 and 739–49, taking into account the change to a measured acre in 1318 (P D A Harvey, *A Medieval Oxfordshire Village*, Oxford, 1965, p 42); Campbell, *op cit.*; Hampshire RO, Eccles 2/159286 – 'In Dat' xiiij *famulis de consuetudine videlicet j preposito j heyward ij Caritariis vij Carucariis j vaccario j Daye pro stipendiis suis in estate per estimationem xiiij acranum sicut lacent ix quarteria dimidium ij bus' videlicet vij bus' cuilibet quia estim' j acra vij bus'* (Despite the phrase *sicut lacent*, it was a measured acre at this time, but smaller than the statute acre – P Hyde, 'The Winchester Manors at Witney and Adderbury, Oxfordshire, in the Later Middle Ages', unpublished BLitt thesis, Oxford University, 1954, Bodleian Library, MS BLitt d 473, pp 39–40; Oschinsky, *op cit*, p 325.

Oseney Abbey) at 1s 1d in 1344-45; at Little Tew (Oxon, Oseney Abbey), from 4d to 1s 2d between 1274 and 1346; and at Stubbington (Hants, Southwick Priory) from 9½d to 11s 6d in the late thirteenth and early fourteenth centuries. Beaulieu Abbey spent 25s and 19s 10½d at Wyke and Coxwell, but only 6d to 1s 4d on other demesnes. At Gussage (God's House, Southampton; Dorset), weeding cost between 2s 2d and 2s 7d in the late thirteenth and early fourteenth centuries. Higher expenditure was made by Merton College on its Oxfordshire manors of Holywell and Cuxham, respectively ranging from 2s 9d to 16s 5¼d and 6s 6d to 9s 5¼d. These figures give some idea of the amounts of cash spent on wage labour for weeding on demesnes of different size and with different resources.⁵

II

These figures, however, do not reveal the full extent of weeding. First, it is important to get behind the sums of money to find out what work was involved. Secondly, these sums represent only the hiring of wage labour, but there were other resources available, through customary labour and the *famuli*. This diversity of labour sources, moreover, makes it diffi-

cult to assess costs per acre or precisely how intensive weeding may have been. The work of the *famuli* is not often stated or enumerated in the accounts, except incidentally. When the work of customary tenants is exceptionally enumerated (usually in works accounts which survive only in a small percentage of accounts), it is not costed. The real cost per acre of weeding is therefore probably not precisely calculable. The rate of investment in wage labour may be an indicator, nevertheless, of the intensity of weeding, but it must be used with caution. On the Bishop of Winchester's estates, for example, wage labour was increasingly hired in the fourteenth century to add to the weeding by the customary tenantry, who had seemingly undertaken most or all weeding in the thirteenth century (see further below). So on large demesnes with large reserves of labour services, the additional use of wage labour is a valid indicator of intensive weeding. On the other hand, there were many small demesnes which had few or no customary services, and these had to rely, apart from the nucleus of the *famuli*, on hired labour. Their reliance on wage labour is not an indicator of intensive weeding. Because the cash resources and cash-flow on these small demesnes was so difficult, the amount that could be expended on maintenance and improvement was severely restricted, and it shows in the amount of labour which could be hired for weeding. Such a situation obtained on several small demesnes of Oseney Abbey and Bicester Priory, and probably explains why no weeding was undertaken by wage labour at Hampton Gay (Oseney) in 1274-5, where there was a small demesne of about ninety-two acres. Similarly, no weeding was done by wage labour on the small demesne at Burton Fleming (Bridlington Priory) in 1335-6: all the weeding was performed by the *famuli*. All the grain at Woodland (Dorset) was hoed for 6s 1d in 1357-8, and wage labour was hired for weeding for 6s 8d on the

⁵ For example, changes in Harvey, *Manorial Records . . . Cuxham*, pp 201 and 235, and L M Midgley (ed), *Ministers' Accounts of the Earldom of Cornwall*, 1296-97, Camden Society, 3rd ser. LXVI, LXVIII, 2 vols, 1945, I, pp 28 and 50; J Z Titow, *English Rural Society*, 1969, p 50; BL Add Roll 25866 ((*Opera*) *Sarclatura*); CUL EDR D8/1/5 (*Opera ad bladum domini sarclandum*); Westminster Abbey Muniments 15340-15341 (*Opera sarclacionis*); PRO SC6/957/13 and 15; Bodl Lib dd ChCh O R 93, 98, 100, 104-5, 108-9, 112; S F Hockey (ed), *The Account Book of Beaulieu Abbey*, Cani Soc 4th ser, XVI, 1975, pp 78 and 91; Winchester College Muniments 15376c, 15379, 15381-15383, 15387, Bodl Lib, Queen's College, Rolls 2-5; Merton Muniments 4467, 4469, 4476-4478, 4481, 4486-4487; Harvey, *Manorial Records . . . Cuxham*, pp 201, 235, 320. For example, WCM 15379: (*Sarclatura*) *bladi. Idem computat in .C.vij. hominibus conductis ad bladum sarclandum quasi per j diem .vj.s.v.d. unde C quilibet eorum per diem ob qua et .vij. quilibet eorum per dimidium diem post prandium qua*.

small demesne of Baldwin de Freyville at the Vern (Herefordshire) in 1358-9, since there were no labour services.⁶

The amount of work represented by the cash payments for wage labour can occasionally be ascertained, more usually in the number of person-days, infrequently in the acreage of grain weeded (Tables 1-2). At Holywell, the accounts consistently show the person-days, varying widely from year to year according to circumstances affecting weed growth presumably. Until the 1330s, the cost of weeding at Holywell, as some other demesnes, was $\frac{3}{4}d$ per person-day, but this increased to $2d$ by 1349-50, and to $2\frac{1}{4}d$ by 1350-51. In some years, for example in 1296, 1299-1300 and c1335,⁷ the entire work was performed by women.

At Holywell and Stubbington, few customary services were available, whilst at Little Tew and Cuxham wage labour was supplementary to weeding by customary tenants. The generally higher level of input into weeding at Holywell reflected husbandry more intensive than on most other Oxfordshire demesnes. The author of the *Husbandry* believed that three acres could be weeded for a penny, which suggests the sort of acreage involved in the cash payments, but costs increased sharply in the middle of the fourteenth century. At three acres for a penny, a substantial part of the sown demesne could have been weeded for the sums involved. The effectiveness of this weeding is discussed below. More explicit evidence of the acreage of grain weeded is provided by the Sevenhampton accounts (Wilts, Adam de Stratton) and, to a lesser extent, on some other

TABLE 1
Weeding at Holywell, 1296-1351*

Date	Cost	Person-days
1296	11s 0d	186
1299-1300	3s 4d	54
1300-1	2s 10 $\frac{1}{2}$ d	46
1303-4	3s 10 $\frac{1}{2}$ d	62
1305-6	4s 6d	63
1308-9	6s 5 $\frac{1}{2}$ d	95
1309-10	2s 9d	42
1310-11	7s 2 $\frac{1}{2}$ d	82
1330-1	3s 7d	43
1332-3	4s 5 $\frac{3}{4}$ d	77
c1335	7s 2d	86
1337-8	4s 4d	52
1349-50	14s 2d	85

* Merton Muniments 4466-4508

TABLE 2
Weeding on some other manors (demesnes)*

Manor	Date	Cost	Person-days
Little Tew	1350-1	2s 0d	24
	1351-2	3s 4 $\frac{1}{2}$ d	27
	1352-3	2s 9d	22
Cuxham	1317-18	6s 6d	105
	1327-8	11s 6d	126
	1328-9	7s 0d	84
Stubbington	c1281	6s 6d	104
Combe	1277-8	3s 2d	51
Coundon	c1350	8s 0d	128
Cotum	c1350	7s 10 $\frac{1}{2}$ d	120
Rickenhall	c1350	6s 8d	80

* For Little Tew (Oxon), Cuxham (Oxon), and Stubbington (Hants), references as in the text. For Combe (Oxon), PRO, SC6/958/3; Coundon, Cotum, Rickenhall (Durham Bishopric), W Greenwell (ed), *Surtees Society*, 32, 1856, pp 220, 247, 254.

demesnes (Tables 3 and 4). In many cases, the accounts also indicate that the cash sum was for weeding all the grain (*In omni blado sarclando* or similar). A further example is the rectorial demesne at Checkendon (Oxon). In 1272, the demesne comprised 109 acres, of which $65\frac{1}{2}$ were sown. In 1281-82, 2s 6d was spent on wage labour to weed 10a. wheat, $26\frac{1}{2}$ a. polver and rye, 7a. barley and 17a. oats. Virtually all the

⁶ Bodl Lib, dd ChCh O R 93: *Sarclacio. Memorandum quod in sarclacione bladurum nichil computat hoc anno*; Borthwick Institute Mon 1: *Sarclacio. Et in sarclacione per famulos manerii. Summa nichil*; R H Britnell, 'Minor Landlords in England and Medieval Agrarian Capitalism', *Past and Pres*, 89, 1980, pp 9-18; Nottm Univ, Dept of MSS, Mi 6/170/85: *In sarclacione bladi domini ad tascham hoc anno .viij.s.viiij.d.*; Mi 5/167/2: *Sarclacio et Falcacio. In toto blado domine hoc anno sarclando .viij.s.j.d.*

⁷ See also Simon A C Penn, 'Female Wage-earners in Late Fourteenth Century England', *Ag Hist Rev*, XXXV, 1987, pp 1-14.

TABLE 3
Sevenhampton (Wilts): weeding by customary tenants.*

Date	Acreage weeded†	Works used
1274-5	488	321
1275-6	629	314
1277-8	481	218
1278-9	474	304
1279-80	480	268
1280-1	468½	296
1281-2	480½	412
1282-3	439	268
1283-4	482½	232
1284-5	448	291
1285-6	478	324
1286-7	439½	116
1287-8	466	340

* M W Farr (ed), *Accounts and Surveys of the Wiltshire Lands of Adam de Stratton*, Wiltshire Archaeological Society Record Series, XIV, 1959, *passim*.

† Figures for this or subsequent year.

TABLE 4
Acreage of grain weeded on some demesnes*

Manor	Date	Acreage weeded	Acreage sown†
Fornsett (Norfolk)	1272-3	46 (wheat)	49¾
		63 (barley)	73
		42 (oats)	45½
		— (peas)	37½
Lenton (Notts)	1297-8	62 (wheat)	62
		89 (rye)	89
		101 (barley)	101½
		104 (peas)	108
Framlingham‡ (Suffolk)	1324-5	183½ (oats)	183½
		117 (wheat)	?
		16 (barley)	?
Crotum (Durham)	c1350	117 (oats)	?
		189 (all)	189

* F Davenport, *The Economic Development of a Norfolk Manor*, Cambridge, 1906, Appendix VIII, p xl; F B Stitt, *Lenton Priory Estate Accounts 1296-1298*, Thoro Soc Rec Ser, XIX, 1958, pp 29, 33-34; J Ridgard, *Medieval Framlingham*, Suf Rec Soc, 27, 1985, p 79; W Greenwell, *op cit*, p 247.

† Figures for this or subsequent year.

‡ In 1286-7, 347 summer works were used for weeding, which suggests that some 350 acres of grain were weeded, as in 1324-5 one work weeded 1a wheat or barley or 1.7a oats. Ridgard, *op cit*, 45, 79.

acreage under crop was weeded by wage labour. The available evidence suggests that the vast proportion of the demesne grain was weeded (Table 5).⁸

At Sevenhampton, weeding was performed almost exclusively by the customary tenants, although we do not know if the *famuli* were involved. A similar situation obtained on the estates of the Bishop of Winchester in Oxfordshire, and also on some of his other demesnes such as Bentley, where the cost of weeding comprised only the cost of food for the customary tenants, and the accounts also specify that all weeding can be performed by the customary tenants.⁹ In the fourteenth century, however, the Bishop resorted increasingly to wage labour to supplement that of the customary tenants.¹⁰ Works accounts for the manors of Wisbech Barton (Bishop of Ely) and Launton (Oxon, Westminster Abbey) also reveal the extent of weeding undertaken by customary tenants.¹¹

Surveys and custumals of large estates clarify the amount of customary labour involved in weeding. At Monk Friston

* Bodl Libr, dd ChCh O R 103-104, 115-16: *Memorandum quod de sarclacione et falcacione nichil hoc anno quia totum fiebat per famulos et Custumarios et famulos de Barth'* (Great Barton); Item in xxvij hominibus locatis ad sarclandum omnia blada preter opera Custumariorum et famulorum .iij.s.iiij.d.ob.; Item in xxij mulieribus locatis ad sarclandum bladum preter opera famulorum .ij.s.ix.d.; Idem computat in iiij sarclantibus conductis ad auxiliandum famulos domini pro blado sarclando .iiij.d.; PRO SC6/957/15: Idem computat in sarclacione bladi ultra custumarios hoc anno; PRO SC6/957/27; In sarclatura .x. acrarum frumenti .xxvj. acrarum et dimidie polver et siliginis .vij. acrarum ordeii .xviij. acrarum auene ad taxam .ij.s.vj.d.

⁹ Hants RO, Eccles 2/159288: Et in expensis de .iiij.s. hominibus sarclantibus per unum diem ante natiuitatem sancti Johannis baptiste .ij.s.ij.d. ob. pro pane et companagio hoc anno quia operabantur tota die (Witney, 1245-6); Eccles 2/159306: Et sciendum quod per ipsos - 44 virgaters - Bladum sarclatur et prata falcantur et leuantur (Witney, 1284-5) and Et sciendum quod isti operarii sarclabant totum bladum et falcauerunt omnia prata (Adderbury, 1284-5); Eccles 2/159408: In caseo empto pro consuetudine Custumariorum domini sarclantium totum bladum domini (Bentley).

¹⁰ Hants RO Eccles 2/159322: In blado sarclando ultra id quod custumarii sarclauerunt .xij.s.iiij.d. (Meredon); 159246: In sarclacione Bladi ultra id quod custumarii fecerunt. xvj.s.viiij.d. et tantum hoc, anno propter humiditatem temporis (Knowle); 159246: Item in iiijth hominibus quasi per j diem conductis pro Bladis sarclandis et aliis herbis nocuis in omnibus Bladis extrahendis .vj.s.ix.d. quorum quilibet capit per diem .j.d. hoc anno tantum quia opera non sufficiencia ad destruendum dictas herbas nocuas tempore oportuno pro multitudine eorundem. (Wargrave).

¹¹ CUL, EDR D8/1/5; WAM 15340-15341.

TABLE 5
Some comparative costs of weeding
5.1 Costs per acre*

Demesne	Date	Labour source	Cost per acre
Cotum	c1350	wage	1/2d
High Clere	14 cent	wage	1/5d
N Waltham	14 cent	wage	2d
Holway	14 cent	customary	1/2d
Lenton	1297-8	wage	3/4d

5.2 Costs per person-day (wage labour)

Demesne	Date	Cost per person-day
Combe	1277-8	3/4d
Coundon	c1350	3/4d
Rickenhall	c1350	1d
Holywell	early 14 cent	3/4d
Knowle	1334-5	1d

5.3 Customary works per acre of weeding

Demesne	Date	Acres weeded per work
Forncett	1272-3	0.6 (wheat) 1.1 (barley) 1.1 (oats)
Framlingham	1324-5	1.5 (wheat) 1.0 (wheat) 1.0 (barley) 1.7 (oats)
Sevenhampton	1274-88	1-2.5 (all)
Alresford	14 cent	0.25

* These are costs of weeding only part of the demesne in some cases, ie other sources of labour were also used.

† Sources: as table 4, except: High Clere - Hants RO, Eccles 2/159408 (*In xxiiij acris ordeij Lj acris Anene sarclandis ad tascham xv.d. pro v acris j.d.*); N Waltham - Hants RO, Eccles 2/159324; Holway - Hants RO, Eccles 2/159338 (*precium operis cuiuslibet acre obulus*); Alresford, Hants RO, Eccles 2/159338).

(Yorks), tenants of bovates had to weed for three days with one man without meat in lieu of Peter's Pence and for half a day instead of boons, the service valued at 2 3/4d in the extent. On manors of the Abbey of Bec, customary tenants at Warley owed one day with one man; at Povington two days; at Brixton Deverill three days; at Atherstone two days with one man; and

at East Wrotham three days with one man. At Combe tenants ought to hoe for one day according to the survey; the account for 1307-8 confirmed that the villeins had hoed 101 acres wheat, but had been complemented by wage labour costing 3s. The 59 virgaters of the Bishop of Lincoln in Wardington and Cropredy (Oxon), owed two days with one man. Customary tenants of Portswood (Hants) in the early twelfth century, hoed half an acre every day between 24 June and 1 August. Tenants on the estates of the Bishop of Hereford weeded for one day.¹²

II

This provision in the surveys for a few days of weeding hardly seems substantive. The days, however, were concentrated in the weeks after the Feast of the Nativity of St John the Baptist (24 June), as illustrated by the services at Portswood. This concentration of effort concurs with the advice of Walter of Henley, who advocated this time as the best for effectively cleaning the ground of thistles and other noxious weeds. Even in the *Rectitudines Singularum Personarum*, in the early eleventh century, the duties of the reeve included supervising weeding in summer (summer defined as May to July). Harwood Long was sceptical whether Walter's advice was implemented. It is clear, however, that weeding was concentrated at this time. The twelfth century surveys of Ramsey Abbey direct weeding to this time, describing June and July as the *tempus sarclandi* or *tempus sarclacionis*, a description found also in the Battle Abbey surveys of the late thirteenth century and at Lympsham in mid-century.

¹² T A M Bishop, 'Extent of Monk Friston 1320', *Miscellanea IV*, Yorks Arch Soc Rec Soc, XCIV, 1937, pp 44-5; M Chibnall (ed), *Documents of the English Lands of the Abbey of Bec*, Cam Soc 3rd ser, LXXIII, 1951, pp 41, 46, 50, 58, 62, 69, 103, 106, 115, 119, 163; Queen's College Oxford MS 366, f xxij; E O Blake (ed), *The Cartulary of the Priory of St Denys near Southampton*, Southampton Rec Soc, 25, 1981, 2 vols, 2, p 211; Rev A T Bannister (ed), *A Transcript of the Red Book of Hereford c 1290*, Camden Miscellany, XV, 1929, pp 6, 8, 15, 30.

The *magna sarclatura* at Felstead (c1223) probably also occurred at this time. In the Burton Abbey survey of Findern, *temp.* Henry I, the customary tenants had to find one man to weed in summer. Similarly, the surveys of the estates of Glastonbury Abbey in the mid-thirteenth century, require weeding in summer, after Whitsun, between 24 June and 1 August (Butleigh, Burton, Newton).¹³

The accounts for Holywell repeatedly reveal why weeding was concentrated in this period: to extract thistles. At Little Tew, in 1337–8, a man and two women were hired to assist the *famuli* to uproot thistles. Thistles and mayweed were tackled by hired labourers at Cuxham in 1318–19 and 1327–8. Increased costs of weeding at Southampton and Gussage in some years (1306–7, 1308–9, 1321–2) were explained by the problem of thistles. Increased costs of weeding at Meredon (Hants), were ascribed to the extravagant growth of thistles. In 1321–2, weeding on some God's House manors was performed by hand to extract thistles and such hand-weeding may have been used at Little Tew and Holywell to combat thistles, as the accounts use the verb *tractare*. Weeding by hand also occurred at Southampton in 1318–19 and at Hickley in 1310–11. In 1306–7, additional labour was employed at Witney because of the heavy growth of weeds. In several years in the early fourteenth century, hand-weeding was used on several manors of the Bishop of Winchester. At Kettering in 1292–3, sixty customary works were used for weeding with hoes, but sixty-six used for hand-weeding

because of *herbe nocue*. Many more examples exist of the resort to intensive weeding by hand to combat weeds and similarly of the concentration of weeding in late June or July, particularly to combat thistles.¹⁴

The effort made to combat weeds is illustrated in illuminated manuscripts such as the Luttrell Psalter. The effectiveness of the effort is debatable. The success or failure of weeding is not illuminated by the accounts; the accounts simply justify the extra cost on the part of the reeve. However, no further technological progress seems to have been made in weeding in the ensuing centuries. Bowden concluded that in the early seventeenth century: 'The cost of weeding was negligible, since many farmers appeared to have attached little importance to the practice, and it was usually undertaken by female workers at about half the ordinary daily wage for men.' He assumed the cost of weeding twenty acres as 6s 8d, at 4d per acre. The effort expended by Henry Best and Robert Loder was hardly more significant. Tusser, writing of East Anglia in 1557, advocated

¹⁴ MM 4486: *Sarculacio. Idem computat in ij tractantibus cardones Ioue ante Pentecosten .j.d.ob. qua* (and for subsequent days until Mon after Holy Trinity); MM 4485: *Sarculacio. Idem computat in vj sarclatoribus tractantibus lappacia acuta et Cardones per ix dies capientibus in die ob qua* (and five more pulling thistles); MM 4487: *Sarculacio. Idem computat in xiiij tractantibus Cardones die martis post festum sancti bamabe per totum diem .xiiij.d. Et in die mercurii in ix tractantibus Cardones .ix.d.-* and so through to the beginning of August; Bodl Libr, dd ChCh O R 105: *Idem computat in j homine et ij feminis conductis pro cardonibus tractandis per ij dies simul cum famulis domini .vj.d.*; Harvey, *Manorial Records of Cuxham*, p 339; Bodl Libr, Queen's Coll Rolls, 5, 196, 273–274, 277–278, 281 (*pro multitudine cardonum cressencium hoc anno; pro multitudine cardonum et male herbe hoc anno; pro multitudine cardonum cressencium hoc anno; propter multitudinem cardonum hoc anno*); Hants RO, Eccles 2/159322: *In xxx operariis locatis quasi per j diem ad herbas extrahendas de blado domini .ij.s.vj.d. cuilibet eorum per diem .j.d. ultra id quod operarii fecerunt propter multitudinem amari* (mayweed); Hants RO, Eccles 2/159408: *In Bladis sarclandis ultra illud quod operarii sarclaverunt .xvj.s. et tantum hoc anno propter inimiam multitudinem cardonum* (Meredon); 159244: *In bladis domini tam manu quam unco sarclandis CCCiiij^{xx}viiij opera; In bladis dominicalibus tam manu quam unco sarclandis CCCCij opera; In Blado domini manuale sarclando CC opera hoc anno In dicto Blado sarclando cum sarculis Clxj opera; and similarly tam manu quam unco in 159244 and 159246 for demesnes at Pountsford, Hull, Holway, Nailsbourne and Staplegrove; Nottm Univ, Mi 5/167/1: In bladis domini sarclandis cum manibus per loca et fasciculis per loca .iiij.s.vj.d.*; Charles Wyse (ed), *The Compotus of the Manor of Kettering AD 1292*, Kettering, 1899, p 76.

¹³ Long, 'Low Yields', p 469; Oschinsky, *op cit*, pp 322–3; W H Hart (ed), *Cartularium Monasterii de Rameseia*, Rolls Series, 3 vols, 1884–94, II, pp 384–5, III, pp 242, 282, 299; R S Scargill-Bird, *Customs of Battle Abbey*, Cam Soc, XLI, 1887, p 30; G Wrottesley (ed), 'Burton Chartulary', *Hist Coll Staffs*, 5, part 1, 1884, p 28; M Chibnall (ed), *Charters & Customs of the Abbey of Holy Trinity Caen*, British Acad Records of Soc & Econ Hist, NS V, 1982, p 92; W Cunningham, *The Growth of English Industry & Commerce during the Early & Middle Ages*, Cambridge, 1910, p 574; for France/Flanders, G Duby, *L'économie rurale et la vie des campagnes dans l'occident médiéval*, Paris, 1962, p 513 (*en juin deux journées de Sarclage*).

weeding of winter grain in May and the rest in June. He encountered the same predominant weeds as the medieval farmer – mayweed, thistles, wild vetch, cockle and boddle. Hillman's commentary on Tusser, of 1710, still complained of the great problem of weeds, which all had to be removed by hand.¹⁵

As well as weeding after the Feast of the Nativity of St John, Walter of Henley advocated a stirring of fallow in the summer, about 24 June, to eliminate weeds, particularly thistles. Long dismissed the extensive use of the *rebinatio*, and doubted its efficacy on technological grounds – the inadequacy of the medieval plough. The summer fallow stirring formed part of the agricultural literature of the Romans, although it is not certain how far it was employed, or whether the idea was diffused into NW Europe. Charlemagne, however, designated June the 'Ploughing Month' and Marc Bloch believed the *rebinatio* was in use in the twelfth century. Certainly it was included in a survey of the manor of the Abbey of Lorraine at Loutzville after 1163. Tenants who ploughed there received three loaves for spring ploughing, two loaves for ploughing in summer, and three for autumn ploughing. Surveys in England during the early twelfth century reveal that it was already present (Table 6 below). Fallow ploughing in summer was to be exacted on four demesnes of Peterborough Abbey, c1125–8, at Felstead about the same time, and at Avening c1170. The evidence is for fallow being ploughed in summer (*waretare in estate, ad garetum in estate*). Summer was normally May to July in the medieval calendar. It seems unlikely that this would be the fallow stirring about April (Easter). Confirmation that it was a June or July

ploughing comes from other twelfth-century evidence. At Finchingfield, c1185, tenants had to plough three roods between Whitsun and 1 August. The stock and land lease of Nastock in 1152 required the lessee to surrender the demesne with *totam saisonam Waretatam . . . xl acras rebinatas*. These words signify both a first fallow stirring about Easter and a summer fallow stirring of part of the demesne. Further examples of summer fallow stirring occur in surveys of the manors of Ramsey Abbey, particularly Hemmingford and Holywell, and possibly also on those manors where ploughing services were required from Michaelmas through to 1 August. A lease of a demesne by the Abbey of Bury St Edmunds in c1191 is further evidence of its existence in the twelfth century. Much, but not all, of this evidence, occurs for eastern England. Possibly the *rebinatio* had origins there, but equally this distribution may only reflect the survival of better sources from eastern England.¹⁶

More widespread references to summer fallow stirring occur in the thirteenth and early fourteenth century (Table 6). The reason is undoubtedly the better and more detailed sources. The term *rebinatio* occurs more frequently. The period of ploughing is defined: at Wicham (1222) half an acre by each tenant before 1 August; at Chisenbury about the Feast of the Nativity of St John the Baptist; at Newthorpe from 11 June to harvest; and at Keston between 24 June and 1 August. On the Glastonbury estates, the vaguer references to ploughing or fallow stirring in summer are better defined in the entries for Badbury, Winterbourne, Grittleton and Nettleton: about the Feast

¹⁵ P Bowden, 'Agricultural Prices, Farm Profits and Rents', in J Thirsk (ed), *The Agrarian History of England and Wales*, IV, Cambridge, 1967, p 662; G E Fussell (ed), *Robert Loder's Farm Accounts, 1610–20*, Cam Soc, 3rd ser, LIII, 1936, pp 16, 19, 34–5; T Tusser, *Five Hundred Points of Good Husbandry*, Oxford edn, 1984, pp 105, 111, 115, 283–4, 299.

¹⁶ References in Table 6. Long, 'Low Yields' p 469; Oschinsky, *op cit*, pp 320–1; A M Watson, 'Towards Denser and More Continuous Settlement: New Crops and Farming Techniques in the Early Middle Ages', in J A Raftis (ed), *Pathways to Medieval Peasants*, Toronto, 1981, p 82; G E Fussell, *The Classical Tradition in West European Farming*, 1972, p 30; L White, *Medieval Technology and Social Change*, Oxford, 1962, pp 56, 71–2; G Duby, *op cit*, p 690.

of St John the Baptist; two weeks before 24 June and two weeks after; between Whitsun and 1 August; from the Thursday after 24 June to 1 August. At Rimpton (Somerset, Bishop of Winchester), the accounts included the cost of two men hired for six days to hold the ploughs whilst the ploughmen mowed the meadow, again indicating the specific time of year, as well as the normal involvement of the *famuli* in fallow stirring. Tenants of Ramsey Abbey had to perform a *lovebone* of ploughing about the Feast of St John the Baptist. The Abbot's manorial court of King's Ripton placed four tenants in mercy in late July 1293 for not ploughing, presumably for not coming to summer fallow stirring. These examples confirm that the ploughing was a summer fallow stirring in June or July.¹⁷

Payments in the accounts reveal that the *rebinatio* was actually being performed (Table 6), as at Wisbech Barton, Tibberton, Cheddington, Newthorpe, Hickley and Southampton, and on several demesnes of the Bishop of Winchester in the early fourteenth century.¹⁸ The specific purpose is described by the accounts for Stevenage, where the *rebinatio* was intended to bring the roots of thistles to the surface to be baked or shrivelled.¹⁹ In the thirteenth and fourteenth centuries, therefore, the *rebinatio* existed in numerous places, with a wide geographical distribution. It existed in regions of Midlands

commonfields and regions outside this area. Its recommendation by Walter of Henley merely reflects that Walter was a conservative advocating established practices.

IV

The apposite questions are how much of the demesne was ploughed and how effective was the *rebinatio*? In the custumals, the amount of land to be ploughed is sometimes specified, and is usually quite small. At Cottingham, five virgaters are to plough one acre; at Fletton a customary tenant owed six days of ploughing in summer (perhaps the equivalent of three to six acres); at Northleach, Colne Roger, Ogbourne, Chisenbury, and Bledlow, each virgater ploughed one acre; and at Wicham only half an acre. At Brightwaltham, tenants ploughed half an acre each as *grasacre* in summer and one acre as further fallow ploughing. These figures suggest that the demesne fallow stirred by customary tenants would be some twenty to forty acres, as Walter of Henley maintained that a plough could cover an acre each day at the *rebinatio*. Using the same yardstick, the acreage stirred at Wisbech Barton may have been as much as seventy acres, but at Cheddington only twenty-three acres. On the Winchester manors of Ecchinswell, Widehay, Ashmansworth, High Clere and Burghclere, the acreage covered by customary services was twenty-three, twenty-seven, eight, thirteen, and thirty-five respectively.²⁰

By all accounts, therefore, the fallow stirring in summer only affected a small proportion of the demesne fallow. However, the figures relate only to customary services, and it seems certain that some of the demesne would have been fallow

¹⁷ References as Table 6. F W Maitland, *Select pleas in Manorial Courts*, Selden Soc, 2, 1888, p 111; Hants RO, Eccles 2/159323: *Caruce . . . In ij hominibus locatis per vij dies ad carucas tenendas dum carucarii ville falcant prata .vj.d.*

¹⁸ Worcester D&C C792A: *Custus carucarum . . . In expensis vij carucarum ad Warectandum mense aprilis .xix.d. In expensis xvj carucarum ad rebinandum mense Julii . . . ij.s.vj.d.*; Lichfield Joint Record Office D&C SS6: *Expense carucarum . . . In mercede j garcionis emtis ad carucas per dietas a festo sancti Barnabe apostoli - 11 June - usque Autumpnum donec j famulus iuit ad carectas per Lxiiij dies . . . MM 5531: Frumentum . . . Item in expensis unius precarie xxj carucarum ad Warectandum et unius precarie xxiiij carucarum ad rebinandum j quarterium et dimidium quarterium*; Hants RO, Eccles 2/159323: *Insuper quelibet caruca arabit j acram in estate sine cibo de consuetudine*, Ecchinswell, twenty-three ploughs, similarly on several other manors in this and subsequent years.

¹⁹ WAM 26348: *In cardonibus et filic' siccidendis ad carucas tempore rebinacionis vij opera.*

²⁰ Oschinsky, *op cit*, pp 316-17; see also C C Dyer, *Lords and Peasants in a Changing Society*, Cambridge, 1980, p 127, and Dyer, *Warwickshire Farming 1349-c1520*, Dugdale Soc Occasional Papers, 27, 1981, pp 14-15.

TABLE 6
References to demesne fallow stirring in summer

Type of doc	Date	Demesne	County	Lord
S	c1125-8	Fletton	The Soke	Peterborough Abbey
S	c1125-8	Fiskerton	Lincs	Peterborough Abbey
S	c1125-8	Cottingham	Northants	Peterborough Abbey
S	c1125-8	Kettering*	Northants	Peterborough Abbey
S	early 12 cent	Felstead	Essex	Holy Trinity Caen
L	1152	Nastock	Hunts	St Paul's London
S	mid-12 cent	Holywell	Hunts	Ramsey Abbey
S	c1170/c1200	Avening	Glos	Holy Trinity Caen
S	1185	Finchingfield	Essex	Templars
L	c1191	Groton/Semer	Suffolk	Bury St Edmunds Abbey
S	1222	Wicham	Suffolk	St Paul's London
S	c1230-47	Ogbourne	Wilts	Bec Abbey
S	c1230-47	Chisenbury	Wilts	Bec Abbey
S	c1230-47	Bledlow	Bucks	Bec Abbey
S	c1235-52	Butleigh	Somerset	Glastonbury Abbey
S	c1235-52	Street	Somerset	Glastonbury Abbey
S	c1235-52	Badbury	Wilts	Glastonbury Abbey
S	c1235-52	Winterbourne	Wilts	Glastonbury Abbey
S	c1235-52	Grittleton	Wilts	Glastonbury Abbey
S	c1235-52	Nettleton	Wilts	Glastonbury Abbey
S	c1235-52	Wrington	Somerset	Glastonbury Abbey
S	c1235-52	Burton	Somerset	Glastonbury Abbey
S	c1235-52	Damerham	Wilts	Glastonbury Abbey
S	c1235-52	Ditchcat	Somerset	Glastonbury Abbey
S	c1235-52	East Pennard	Somerset	Glastonbury Abbey
S	c1235-52	Douling	Somerset	Glastonbury Abbey
S	c1235-52	Shapwick	Somerset	Glastonbury Abbey
S	c1235-52	Ashcot	Somerset	Glastonbury Abbey
S	c1235-52	Walton	Somerset	Glastonbury Abbey
S	mid-13 cent	Rimpton*	Somerset	Glastonbury Abbey
S	mid-13 cent	Barnwell	Hunts	Bp of Winchester
S	mid-13 cent	Northleach	Glos	Ramsey Abbey
S	1266-7	Colne Roger	Glos	Gloucester Abbey
S	1266-7	Saltford	Oxon	Gloucester Abbey
S	1279-80	Hinton	Camb	John fitzJohn et al
S	1279-80	Stanton	Camb	Countess de Ferar
S	1279-80	Keston	Hunts	Ramsey Abbey
S	1279-80	Aylington	Hunts	
S	1279-80	Sawtre	Hunts	
A	1286-7	Framlingham	Suffolk	

A	c1292	Kettering	Northants	Peterborough Abbey
A	c1295	Newthorpe	Yorks	D&C York?
A	1297-8	Glatton	Hunts	Earl of Cornwall
S	late 13 cent	Appledurham	Sussex	Battle Abbey
S	late 13 cent	Brightwalham	Berks	Battle Abbey
A	1322-3	Morbourn	Cambs	Crowland Abbey
A	1322-3	Cottenham	Cambs	Crowland Abbey
A	1307-	Rimpton	Somerset	Bp of Winchester
A	1307-	Eccinswell	Hants	Bp of Winchester
A	1307-	Widchay	Hants	Bp of Winchester
A	1307-	Ashmansworth	Hants	Bp of Winchester
A	1307-	Ivinghoe	Cambs	Bp of Ely
A	early 14 cent	Wisbech	Herts	Westminster Abbey
A	early 14 cent	Stevenage	Worcs	Worcester Cathedral
A	early 14 cent	Tibberton	Cambs	Merton College
A	early 14 cent	Gamlingay	Bucks	Merton College
A	early 14 cent	Cheddington	Hants	God's House
A	early 14 cent	Hickley	Hants	God's House
A	early 14 cent	Southampton	Hants	God's House

* see below for accounts which reveal the performance of the *rebinatio*.

The dates do not imply the inception of the *rebinatio*, merely the first recorded mention. In the case of surveys, they may reflect the position at an earlier time. For example, surveys of the thirteenth century may relate back to conditions in the twelfth or earlier. The type of document is important; surveys may suggest only a theoretical obligation to do the work, whereas accounts record its actual performance.

S = survey; A = Account; L = Lease (covenants).

Sources: T Stapleton (ed), *Chronicon Petroburchense*, Cam Soc, 1st ser, 47, 1848-9, 'Liber Niger', pp 157, 159, 164-5; M Chibnall (ed), *Charters & Customs of the Abbey of Holy Trinity Caen*, Brit Acad, Rec Soc & Econ Hist, NS V, 1982, p 34; W H Hale (ed), *The Domesday of St Paul's*, Camd Soc, 1st ser, 69, 1858, p 133; W H Hart & P A Lyons (eds), *Carularium Monasterii de Ramseya*, Rolls Series, 3 vols, 1884-94, III, p 282; M Chibnall, *op cit*, p 65; B A Lees (ed), *Records of the Templars in England in the Twelfth Century*, Brit Acad Rec Soc & Econ Hist, IX, 1935, p 11; H S A Fox, 'Some Ecological Dimensions of Medieval Field Systems', in K Biddick (ed), *Archaeological Approaches to Medieval Europe*, Kalamazoo, 1985, pp 127-8; W H Hale, *op cit*, p 34; M Chibnall (ed), *Documents of the English Lands of the Abbey of Bec*, Camd Soc 3rd ser, 73, 1951, pp 37, 55, 119; C Elton (ed), *Renalia et Custumaria Michaelis de Ambresbury, 1235-1252, et Rogeri de Ford, 1252-1261*, *Monasterii Beatae Mariae Glastoniensis*, Soms Rec Soc, 1891, pp 7-8, 12, 58, 61, 65, 68, 72, 96, 108, 115, 125-6, 129, 150-1, 153, 156; T J Hunt (ed), *The Medieval Customs of the Monastery of Taunton and Bradford on Tone*, Soms Rec Soc, 66, 1962, p 27; *Cart Mon Ramseya*, II, p 50; W H Hart, *Historia et Carularium Monasterii Gloucestriae*, Rolls Series, 3 vols, 1863-7, III, pp 181, 205; W Illingworth and J Caley (eds), *Rotuli Hundredorum*, Rec Commis, 2 vols, 1812-18, II, pp 440, 615, 622, 657, 659, 661, 728; J Ridgard (ed), *Medieval Framlingham, Select Documents, 1270-1297*, Cam Soc, 3rd ser, 66 and 68, 2 vols, 1945, p 177; S R Scargill-Bird (ed), *Customs of Battle Abbey, Accounts of the Earl of Cornwall, 1296-1297*, Cam Soc, 3rd ser, 66 and 68, 2 vols, 1945, p 177; S R Scargill-Bird (ed), *Customs of Battle Abbey*, Camd Soc, 1st ser, 41, 1887, pp 54, 60; F M Page, *The Estates of Crowland Abbey*, Cambridge, 1934, pp 244-6, 261; Hants RO, Eccles 2/159323, 159324, 159408; CUL, EDR D8/1/1, 3, 5-6; Westminster Abbey Muniments 26348; Worcester D&C C792A; Mrs E Lowry, 'The administration of the estates of Merton College in the fourteenth century', unpublished DPhil, 1933, Oxford Univ, Bodleian Library MS DPhil c 70, p 62; Merton Muniments 5531. MM5531 shows the *rebinatio* in use at Cheddington in 1297-8; Bod Lib, Queen's Rolls 188, 269-271.

ploughed by the demesne ploughmen (*carucarii*), particularly for their summer wage. For example, when the ploughmen at Rimpton were diverted to haymaking, other men had to be hired to plough. Even so, the acreage involved was probably only a part of the demesne fallow. One reason for not ploughing a larger part of the demesne fallow was the need to provide fallow pasture for livestock, particularly sheep. This need would have been particularly great in the thirteenth and fourteenth centuries as flock sizes increased. The need may not have been as great in the twelfth century, when flock numbers were considerably smaller on some estates. In East Anglia, where there were larger reserves of pasture and marsh, more of the demesne fallow may have been ploughed. The lighter soils in East Anglia may also have been more easily worked by the fallow plough than the stiffer soil of the Midland Plain, although references to summer ploughs occur in several places.²¹

An additional strategy to combat weeds was intensive sowing to smother weeds. Campbell concluded that heavy sowing of oats at 6 to 8 bushels per acre in parts of eastern Norfolk was 'clearly intended to act as a smother crop'. Mate reached the same conclusion about intensive sowing on some manors of Canterbury Cathedral Priory, where the rate was also eight bushels. Oats were a notoriously thin, light crop, susceptible to weeds. Even in regions where grain was less intensively sown, oats were normally sown at a higher rate of four bushels per acre. On the demesnes of the Bishop of Winchester in Oxfordshire, where quite conservative husbandry prevailed, oats were sown at five to six bushels per acre. On some other Oxfordshire demesnes, oats yielded so poorly that lords

turned to dredge or legumes for livestock feed instead of oats.²²

With the problem of the cleanliness of the arable, historians are confronted with the margin of technology and the marginal cost of production. The records reveal that efforts were made towards cleaning the soil, often intensively. Technology was restricted to hand-weeding and hoeing, and the summer fallow stirring. An increase in effectiveness, without technological change, depended on an increased input of labour. It seems clear, however, that no more advanced technology was available to the early modern farmer. Differences in productivity between regions in the middle ages, and between the middle ages and later periods, were multi-causal. Basically, these changes derived from improvements in agricultural technique rather than measurable technological advance: increase in and better use of livestock resources, intensive manuring, intensive sowing, intensive input of labour across all tasks, and convertible husbandry. Low yields were the consequence of failure to adopt these practices; weediness was a contributory factor, but not a sole determinant.

²¹ H S A Fox, 'The Alleged Transformation from Two-field to Three-field Systems in Medieval England', *Econ Hist Rev*, 2nd ser, XXXIX, 1986, p 537; J Langdon, *Horses, Oxen and Technological Innovation*, Cambridge, 1986, p 140.

²² Campbell, 'Arable Productivity', p 31; Mate, 'Medieval Agrarian Practices', pp 25-6; Titow, *Winchester Yields*, pp 40-2; D Postles, 'Grain Yields from Some Properties of Osney Abbey', *Oxonien-sia*, XLIV, 1979, pp 30-7; F B Stitt (ed), *Lenton Priory Estate Accounts 1296-1298*, Thoroton Soc Rec Ser, XIX, 1958, p 34 (oats sown at 8 bs per acre near Nottingham).

APPENDIX

A note on the most frequently mentioned weeds*

	Weed	Latin name	Vernacular name	Occurrence
1	Thistle	Cardo		Mereden (Hants) Cuxham (Oxon) Holywell (Oxon) Little Tew (Oxon) Southampton (Hants) Hickley (Hants) Gussage (Dorset) Stevenage (Herts) Frequently in all accounts
2	Mayweed	Amarusca -amarc'	-maythes	Cuxham
3	Sheep's sorrel or dock or greater burdock	Lappacia acuta	-dokys -dokkes	Holywell Forngett (Norf)
4		-filic'		Stevenage
5			-walewrt	Forngett (Norf)
6			-hamerokes	Forngett (Norf)
7			-quiches	Yeoveney (Surrey)

* Both mayweed and greater burdock are invasive of loamy soils rich in nitrogen; mayweed has a penchant for cornfields. Their predilection for rich loamy soils with nitrogen may suggest something about the animal dung content of fallow pastures.

At Forngett, walewrt, hamerokes and docks were weeded out from the wheat. At Yeoveney, quiches had to be weeded from the fallow pasture before the sowing of barley. According to Tusser (1557) and Hillman (1710), mayweed, thistle, were still the predominant problem; thistle and dock infested fallow pastures: 'Thry fallow betime for destroing of weede, least thistle and duck fall a blooming and seede' – Tusser on July. Other problems in the corn were wild vetch or tare, fern or brake, corn cockle (*Ayrostemma githago*) and boddle or corn marigold (*Chrysanthemum segetum*).

Corn cockles do not seem to be mentioned in the middle ages, but they may have been a problem. In a charter of 1004, Aethelred II was made to complain of the Danes 'sprouting like cockles amongst the wheat': P H Sawyer (ed), *Anglo-Saxon Charters*, 1968, no 909, cited by Ann Williams, "'Cockles amongst the Wheat" Danes and English in the Western Midlands in the first half of the Eleventh Century', *Midl Hist*, XI, 1986, p 1.