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BOOK NUMBER	59-681322
CLASS MARK	SB 199
	Perkins





AN ESSAY  
ON THE BEST MEANS OF CONVERTING  
GRASS LANDS INTO TILLAGE  
*Without exhausting the Soil,*  
AND OF RETURNING THE SAME TO  
GRASS,  
IN AN IMPROVED STATE.

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By JOHN TUKE,  
LAND SURVEYOR.

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“ Tell him, Sir, it will yield abundance of gallant Corne to supply the whole country, and raise great summes of money to your purse, and afterward (if you plow moderately) it may keep as many Cattell, nay more, yet nothing takes with him, he will have no Enclosure plowed by no means; yet seriously weigh these ensuing particulars, and then use thy own will and pleasure.”

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WALTER BLITH.

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YORK:

Printed by T. WILSON and R. SPENCE, High Ousegate.

1803.



## ESSAY, &c.

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THE improvement of old coarse sward land, by ploughing for a few years, and afterwards laying it down again to grafs, was well known to that excellent agriculturist, Walter Blith, so early as the middle of the seventeenth century, and is equally so at this time to those who are grateful enough to make a generous return for its favours; but it is too often the case, that the avarice of the farmer induces him to crop the land so long as it will produce sufficient to pay for labour; it is then become so exhausted, as to require many years, and much expense in manure, to renovate it: hence arises the general antipathy of landlords to their tenants ploughing out such lands, and not without sufficient reason, but that it may be done to the improvement of the land, as well as to the profit of the occupier, I am certain of, if a plan similar to the following be observed.

When the land is wet and spongy, it should, in the first instance, be effectually drained,



otherwise the lime or manure, which, in future, may be laid upon it, will, in a great measure, lose their effect, the produce would be little but weeds, the corn always light, and no permanent improvement would ever take place.

When the sward is thick and coarse, and intermixed with moss or rushes, and the soil consists either of strong loam, black moory sand or clay, (except poor thin cold clays,) it is always best to pare and burn, which at once destroys the texture of the sod, and makes the land easy to work: this operation is performed in the following manner.

The labourer being provided with a proper instrument, called a paring spade, he thrusts this forward under the sod with his thighs, by the exertion of his loins, which cuts the sods about one foot in breadth; and, by raising the right side of his spade, he turns them off with the grass-side downwards, of any length he pleases, which is usually about three feet, and generally as thin as the nature of the turf will allow: if the surface is coarse and rough, and there is a good depth of soil, it admits and requires a thicker sod than if the herbage be fine, so that the thickness of the sod will vary from one to two inches. If the weather

be dry, they will be fit to burn in a week or two, by lying as the spade leaves them, with their roots exposed to the sun and winds; but if the weather be wet, it is necessary to employ women or children to set them up on edge, to expedite their drying; after which they are put into heaps, of the size of a small hay-cock, care being taken to lay them light and open within, but to keep them close covered on the outside, during their burning, to prevent too rapid combustion, which would destroy the fertilizing quality of the ashes.

If the sods are not required to be set on edge to dry, the operation may be done for about one guinea per acre.

There is not a doubt but that paring and burning renders the land extremely fruitful for a time; but if it is not supported by adventitious aids, and indulged by suitable croppings, it becomes more completely exhausted than by any other mode of cultivation; it is therefore necessary, where those aids cannot be conveniently had, that, before that fertility be exhausted, green crops should be grown, and consumed by cattle or sheep, which would restore that which had been spent in the production of corn, or other



exhausting crops: to effect which, I recommend the following mode of cultivation and cropping for the better kinds of clay or strong loams.

Let the paring and burning be done as early in the spring as the weather will permit; and, in order to reap the utmost benefit from the ashes, the sods, before they are burnt, should be removed from the ridges of the lands to the sides, leaving a bare space of about five feet wide, which should be ploughed to the depth of at least six or seven inches: the sods may then be made into heaps on the ploughed part; and, whilst burning, the sides may be ploughed, after which the ashes may be spread on the surface of the new-ploughed land: by this process, the ashes get minutely mixed with the soil, and within reach of the roots of the crop sown thereon. It is common to burn and spread the ashes before the land is ploughed; by so doing, the ashes lie beneath the furrow, and are therefore in a great measure lost to the first crop, and a great part of the salt contained in them is washed away before another crop succeeds; which inconvenience is prevented by adopting the mode above recommended.

I have had some practice in paring and burning, and my employment has afforded me frequent opportunities of observing the process and effect thereof: I have always found that upon the soils last mentioned, it is the best way of breaking out old grass land; and if a proper treatment of the land be observed, there is an evident superiority in its favour, when the land is returned again to grass, to that which has been broke out by only ploughing. I have seen a field of strong clay land which had then been twenty years laid to grass, after having been a few years under the plough: the coarsest part of it was broke out by paring and burning, and the finer part of it by ploughing only, and, notwithstanding it was at that distance of time after, there was a very striking difference in favour of the paring and burning, it being a sweeter herbage, and not so much infested with rushes.

The course of crops I have adopted, after paring and burning a rather loamy moist soil, has been, rape sown in the beginning of June, and eaten with sheep in time to sow wheat for the second crop; 3d, Turnips drawn off in time to sow wheat for the fourth crop, which crop is now growing; and I intend to sow grass seeds amongst the wheat in the spring

The rape was sown with no other manure than the ashes; but for the turnip crop, about 16 tons of strong town's manure, and four chaldrons (32 bushels each) of lime per acre was laid on, the crop was a remarkably good one.— This course I adopted from its not being exhausting to the soil, and wishing to have it again in grafs as soon as I could; or there are other courses of crops which may be practised with more profit and with no more injury to the soil; those I recommend for clays or strong loams, are, 1st, oats; 2d, rape, for a green crop; 3d, wheat; 4th, beans, or pease hoed; 5th, rape for a green crop; 6th, oats or barley, with which crop, the grafs seeds should be sown. As lime always answers incomparably well, whilst the ashes are fresh, and by its action as a septic, prepares the roots of the sward which lay below the paring spade for food for future vegetation, it should always be used plentifully in the fore part of the course, and, therefore, not less than six chaldrons per acre should be laid on for the first green crop of rape, this crop should be eaten upon the land with sheep. For the next green crop of rape, the land should be well manured with dung, or some other rich oleaginous manure, which the ashes and lime, before deposited in the soil, will improve for

the nutriment of succeeding crops. If the soil is not unsuitable for Barley, I recommend that crop from my own experience, in preference to oats to sow the grafs seeds with, having always had the seeds thicker set, and better grown amongst the former than the latter.

The kinds and quantity of grafs seed per acre necessary to be sown on strong land, are of white clover, 10lb.; cow-grafs, 6lb.; trefoil, 6lb.; rib-grafs, 4lb.; rye-grafs, 1 bushel; and of good hay-seeds, if they can be got, 4 bushels.

Or the following course of crops may be used on those soils; 1st, rape for seed; 2d, wheat; 3d, rape for a green crop; 4th, barley or oats; then grafs; or instead of grafs, 5th, red clover; 6th, wheat; 7th, rape for a green crop; 8th, barley or oats, with which crop, grafs seeds should be sown. In this course, the land after it has been pared, burnt, and once ploughed, should be limed with six chaldrons of lime per acre, and afterwards have one or two more ploughings, and be well harrowed before the rape-seed is sown; for the green crops of rape, the land should be well manured with dung, and the crop eaten with sheep.

Upon soils of less fertility than the foregoing, the following courses are excellent: 1st, rape, for a green crop; 2d, oats; 3d, rape, for a green crop; 4th, wheat; 5th and 6th, grafs pastured and ploughed out for wheat\*, (the 7th year) 8th, green crop of rape; 9th, oats or barley; then grafs for five or six years, or instead of grafs the 5th year, beans or pease; 6th, grafs seeds sown without a crop of corn. In these courses, the land should be limed for the 2d crop of rape, after the rate of six chaldrons per acre, and both crops of rape should be eaten with sheep: the land should be winter ploughed for the bean crop, and early in spring, should be well manured with dung, and the beans should be sown in drills, and clean hoed: as soon as the land is cleared of the crop, it should be ploughed and have another ploughing early in spring; after this, it should be repeatedly harrowed at proper intervals, to destroy all the weeds which may appear, and to make the surface as even as possible.

In April, take an opportunity of showery weather, to sow two pecks of rye and one

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\* When land is laid to grafs with a crop of wheat, the grafs seeds should be sown in spring.

bushel of tares, which should be harrowed in; then sow the grafs seeds, and either brush them in with thorns, or roll them in with a light roller.

The grafs seeds, by being sown in this manner, will be deposited in the ground of nearly an equal depth, and not too deep; they of course come up evenly; and by the weeds of the preceding year, as well as those which have grown in spring, having been thoroughly destroyed, they will not be incommoded by them, as is the case when they are sown on land new ploughed; by the seeds being harrowed in, many of them are buried too deep, and consequently never come up; and the seeds of weeds which lie within the influence of the air, grow amongst the grafs, to the great injury of it.—When the rye and tares are grown to be about 3 or 4 inches long, turn in a moderate stock of sheep, which keep increasing as the pasture improves, taking care not to eat it down close, but to keep a good cover; by this means, an immense stock of sheep for the quantity of land will be kept, and the young grafses will be sheltered by the rye and tares from the scorching rays of the sun, whilst the sheep are dropping a large quantity of manure to

the enrichment of the land.—This mode, and others nearly similar, I have practised several times, and always found them to answer well.

The best course for a black moory sand is, 1st, rape or turnips; 2d, oats; 3d, turnips; 4th, rye; then grafs. For the first crop of turnips, the land should be limed after the rate of four chaldrons per acre, and harrowed in with the ashes; the second crop of turnips should be manured for, and both crops eaten upon the land with sheep—the grafs seeds should be sown in the spring amongst the rye; these should consist of 10lb. of white clover, 10lb. of trefoil, 4lb of rib-grafs, and 1 bushel of rye-grafs.

For peat land, no better course can be used than rape, oats, rape, oats, grafs; for the latter crop of rape not less than 6 chaldrons of lime per acre should be spread upon the land: the grafs seeds should consist of 1 bushel of rye grafs, 14lbs. of white clover, and 8lbs. of rib grafs, which should be sown in spring with the last crop of oats.

In each case the land should continue 4, 5, or 6 years in grafs, when it may be again



ploughed out, and clay or strong loam soils may then be properly cropped in the following courses: 1st, oats; 2d, rape, for a green crop; 3d, wheat; then grafs, to continue 4 or 5 years. The green fallow should be well limed and manured, and the crop eaten upon the land with sheep. Or for rich strong loam, 1st, turnips on once ploughing; 2d, barley or oats; 3d, clover; 4th, wheat; 5th, green crop of rape, or turnips, to be eaten with sheep; 6th, barley; then grafs. In breaking up the land for this course, it should be deep and well ploughed in January or February, if grafs should grow in the seams in spring, some sheep should be turned in to eat it; in May it should be manured with short manure, and afterwards well harrowed; and in showery weather in June, the turnip seed should be sown and harrowed in: in this manner I have seen excellent crops of turnips obtained, and they may be thus grown and eaten on soils not suitable for them by any other mode, the sod gives a firmness to the soil which supports the tread of the sheep, and there is always a mellowness acquired by land being well laid a few years to grafs, which makes it approximate nearer to a turnip soil: for the first barley crop the land should be twice ploughed, the clover crop should be manured, and for the green fall



low of rape the land should be limed with not less than 5 chaldrons per acre. The grafs seeds should consist of the same kinds, and in the same proportions, as before-mentioned for this kind of land.

Breaking out grafs land without paring and burning is applicable to all dry, sandy, gravelly, and chalky soils, light loams, and cold thin clays; the courses of crops which I have practised and found to answer best on those soils, except thin clays, are, 1st, oats; 2d, turnips; 3d, barley; then grafs; or, 1st, rye; 2d, turnips; 3d, barley; then grafs: or if the soil is a rich light loam, or good gravel, the course may be continued; and instead of grafs, 4th, red clover or tares; 5th, rye or wheat; 6th, turnips; 7th, barley, and then grafs. Each of these courses, when the turnip crops are well matured for, and clean hoed, leave the land in fine order to be laid down again to grafs.

The grafs seeds should consist of 12 lb. of white clover, 12 lb. of trefoil, and 1 bushel of rye grafs per acre.

Cold thin clay soil is never kept long in tillage with profit, and therefore should not be ploughed out of grafs until it is become un-

productive. When it is old sward, it is best to plough about five inches deep for oats, and those should be of a hardy kind, such as Tartarian or Scotch oats. Immediately after the ground is cleared of the crop, cros-plough and grip it; early in spring, harrow it well and manure it with 10 loads of good manure; then plough, harrow, and drill it with beans, which should be kept clean by hoeing; and immediately after harvest, plough up the land and lay it perfectly dry by water-furrowing and gripping; in spring plough once, and sow the grafs seeds, and treat them in the same manner as before recommended, to be sown without a crop of corn. The grafs seeds should consist of 12 lb. of white clover, 8 lb. of trefoil, 8 lb. of cow-grafs, or red clover, and 1 bushel of rye-grafs.

This kind of land thus sown, will bear to lie about 4 or 5 years, when it should be again broke out and be sown with wheat on once ploughing, next beans and grafs-seeds as above.

As general observations on laying down every kind of soil to grafs, particular attention should be paid to have the surface as even as possible before the grafs seeds are sown; and if

that is done early in the spring, rolling them in will be sufficient, and in every case brushing them in with thorns is preferable to harrowing. Young sward is much thickened and improved by being pastured for the first two years, and during the first winter and summer it should never be close eaten, and during that time only by sheep.

If the land has been treated as above directed, the grafs will require no manure for the first two or three years.

On permission being given to a tenant, restricted by his lease or agreement, to plough out grafs-land, he may afford to pay an advance of rent which appears by the following statement.

I will suppose the soil to be clay or strong loam, in old sward, of 15s. per acre value, and that it be cropped in the first-mentioned course.

*Dr.*

FIRST YEAR.

To Paring, burning, and spreading the Ashes,	£. s. d.
To Ploughing,	1 10 0
To Six bushels of Seed Oats,	0 7 0
To Sowing,	1 10 0
To Harrowing seven times,	0 2 0
To Reaping,	0 7 0
To Carting home, thrashing, and taking to market 5 qrs. $4\frac{2}{10}$ bush.	0 10 0
To Tithe,	1 1 0
To Profit,	4 16 0
	<hr/>
	10 10 0

*Cr.*

By 6 qrs. of Oats at 30s.	£. s. d.
	— 9 0 0
By Straw,	— 1 10 0
	<hr/>
	10 10 0

( 16 )

SECOND CROP.

To four Ploughings,	1 0 0
To ten Harrowings,	0 10 0
To raking up or gathering the Quicks,	0 4 0
To six chaldrons of Lime, at 12s.	3 12 0
To spreading ditto	0 3 0
To Rapeseed,	0 1 0
To Tithe,	0 6 0
	<hr/>
	5 16 0

By a green Crop of Rape,	— 3 0 0
By Lofs,	— 2 16 0
	<hr/>
	5 16 0

Dr.

THIRD CROP.

To Ploughing,	—	£. s. d.
To two bushels Seed Wheat,	—	0 6 0
To Sowing,	—	1 0 0
To Harrowing,	—	0 2 0
To Weeding in Spring,	—	0 3 0
To Reaping,	—	0 2 0
To Tithe,	—	6 8 0
To Carting from the Field, thrashing, and taking to market 2 qrs. 5 <sup>5</sup> / <sub>16</sub> bush, at 4s.	—	1 8 0
To Profit,	—	0 10 9 <sup>1</sup> / <sub>2</sub>
	—	9 19 2 <sup>1</sup> / <sub>2</sub>
	—	<hr/>
	—	14 0 0

By 3 quarters of Wheat,  
By Straw,

—	£. s. d.
—	12 0 0
—	2 0 0
—	<hr/>
—	14 0 0

( 17 )

FOURTH CROP.

To two Ploughings,	—	0 11 0
To Harrowing,	—	0 3 0
To two bushels Seed Beans,	—	0 10 0
To Drilling and Horse-hoeing,	—	0 7 0
To Tithe,	—	0 15 0
To Reaping,	—	0 5 0
To Carting home, thrashing, and taking to market,	—	0 11 0
To Profit,	—	4 8 0
	—	<hr/>
	—	7 10 0

By three quarters of Beans at 40s.  
By Straw,

—	£. s. d.
—	6 0 0
—	1 10 0
—	<hr/>
—	7 10 0

*Dr.* FIFTH CROP. *Cr.*

To three Ploughings, _____	£. s. d.	
To Harrowing, _____	0 15 0	
To ten Loads of Manure spread upon the Land, _____	0 10 0	
To Rapeseed, _____	5 0 0	By green Crop of Rape,
To Tithe, _____	0 1 0	
	0 7 0	By Lofs, _____
	<u>6 13 0</u>	

£. s. d.  
 \_\_\_\_\_ 3 10 0  
 \_\_\_\_\_ 3 3 0  
 \_\_\_\_\_ 6 13 0

SIXTH CROP.

To two Ploughings, _____	0 11 0	
To four Harrowings, _____	0 4 0	
To six Bushels of Seed Oats, _____	1 10 0	
To Sowing, _____	0 2 0	
To Reaping, _____	0 7 0	
To Tithe, _____	1 12 0	
To Carting home, thrashing, and taking to market 6 qrs. $2\frac{1}{8}$ bush. at 2s. _____	0 12 7	By 7 quarters of Oats, at 40s.
To Profit _____	11 1 5	By Straw, _____
	<u>16 0 0</u>	

\_\_\_\_\_ 14 0 0  
 \_\_\_\_\_ 2 0 0  
 \_\_\_\_\_ 16 0 0

RECAPITULATION.

To lofs of second Crop, _____	2 16 0	By profit of 1st Crop, _____
To lofs of fifth ditto, _____	3 3 0	By ditto of 3d ditto, _____
To balance of Profit in a six years Course, _____	24 5 7½	By ditto of 4th ditto, _____
	<u>30 4 7½</u>	By ditto of 6th ditto, _____

\_\_\_\_\_ 30 4 7½

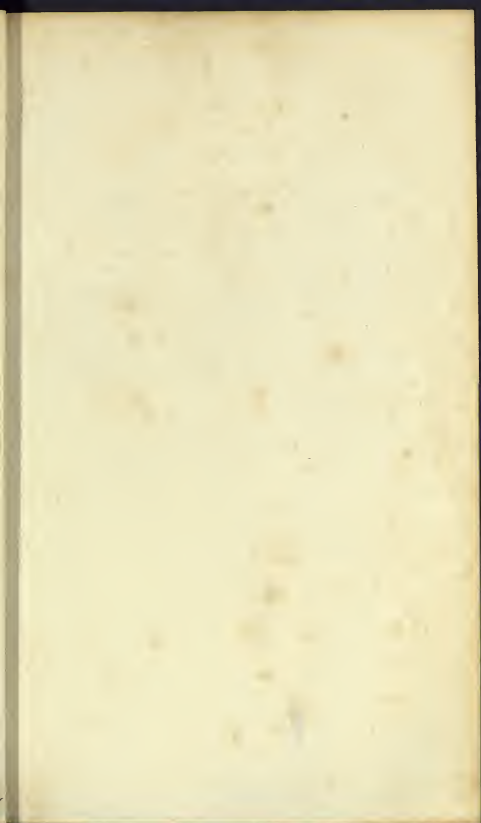
Thus it appears that an acre of old sward land, cultivated as above for 6 years, leaves a surplus of 24l. 5s. 7d. above all expenses of cultivation and tithe, which averages near 4l. 1s. per annum. Parliamentary and parochial taxes are not noticed, as the land is equally liable to those taxes in one state as the other, it therefore remains to show what would be the value of the produce of the same land in old sward. The given price of the land is 15s. per acre; a beast-gate will require one acre and a half, the value of which will be 2l. 10s. and add 15s. more for a profit on the beast grazed, amount together to 3l. 5s. for one acre and a half, or 2l. 3s. 4d. per acre, leaves a difference in favour of cultivation of 1l. 17s. 8d. per acre per annum. But as an additional expenditure and industry is required from the tenant in cultivation, the greatest part of the profit arising therefrom is due to him; but when he has not a right to plough out his land without the consent of his landlord, it is reasonable that the latter should have a proportion of the profits, and in this view one-fifth appears to me a fair proportion for him to have; this makes an advance of 7s. 6d. per acre; and if the land be sown down as before directed, it will, in that state, con-

tinue to be worth the advance until it requires to be ploughed out again.

Though it is to the interest of tenants to sow proper quantities of grass seeds of the best quality; yet we frequently see, that, either from poverty or avarice, there is neither a sufficient quantity sown, nor are they of a good quality: it is therefore safest, when that is the case, for the landlord, or his agent, to procure the seeds.

THE END.









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