The Edinburgh School of Agriculture

The Edinburgh and East of Scotland College of Agriculture

Economics Department

Piece-Work Potato Gathering

by

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EDINBURGH AND EAST OF SCOTLAND COLLEGE OF AGRICULTURE

Economics Department

WITH THE COMPLIMENTS

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FOREWORD

THE harvesting of the potato crop presents a problem of organisation which has to be solved annually by farmers working under very variable conditions of soil, type of crop, acreage grown, etc. In the main the solution of this problem has been to supplement the regular workers on the farm by the employment of gangs of casual workers—men, women and children, either separately or as mixed gangs—to pick the potatoes in the field. In recent years it has become increasingly difficult to find enough casual labour at ordinary day rates to harvest the crop in the limited time available. It is probable that this difficulty will become greater in the future. The production of a machine capable of doing this work under all conditions and thus offering a solution on these lines has still to come. It is important and timely, therefore, to consider any other possibility which may alleviate the present situation.

This report on " PIECE-WORK POTATO GATHERING " prepared by Mr C. J. Black is the result of a long period of intensive and detailed study of potato harvesting under actual field conditions. It is not claimed that the procedure outlined in the report can be applied indiscriminately ; on the other hand it does bring to the fore a method of organising the harvesting work which could make the maximum use of the restricted supplies of labour likely to be available in the future. Piece-work has been tried out and has been found to be successful, successful to the farmer and satisfactory to the workers. On these grounds alone this discussion of the problem merits the careful attention of growers and all others concerned with the harvesting of this important crop.

The sincere thanks of this Department are due to all those farmers, farm workers, merchants and College advisers whose co-operation made this study possible.

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PIECE-WORK POTATO GATHERING

Introduction

Piece-work potato gathering is already practised by a number of growers in Scotland, and there is little doubt that the extension of this method of organisation is a practical answer to the growing shortage of gatherers at harvest time. Payment by results is a proved way of obtaining maximum output from a restricted number of workers and there is at present considerable scope for improving the output from adult or nearly-adult gatherers. Indeed, it is considered that on providing satisfactory incentives outputs should increase to between one and a half times to twice the present levels. The attraction of piece-work from the workers' point of view is that it increases substantially their earning capacity, whilst the farmer is assured that he will receive a greater amount of work for his higher expenditure on labour.

Basic Needs

The first and foremost requirement for piece-work gathering is that the size of gangs should be reduced to about 10 gatherers. Consequently the digger will have to work only one side of the break of potato drills. Existing diggers are quite satisfactory provided the drivers are given a target number of drills to dig per hour. The target should be set according to the capacity of the gatherers and the crop being harvested. For example, with 210 yard drills and 3 acres to lift in the day, the target will be 12 drills in each hour of work, or one drill every five minutes.

The new mounted machines can be recommended for piece-work because the tractors can lift and carry the diggers at fast speeds on the " idle " return journey from the far end of the drill. They can therefore dig a greater acreage in the day than the trailed implements and can do this without any increase in the actual digging speed. All the same, trailed diggers are not to be rejected for piece-work gathering. The possible complication is that, because of the one way working, two diggers may be needed to keep the small gang of gatherers supplied with potatoes. It does not matter whether the digger is of the elevator or spinner type, provided the latter leaves a normal swath which is within the gatherers' reach.

An alternative machine is the two row elevator digger which works backwards and forwards across the field whilst, as above, digging only on one side of the break. It can be recommended where the ground is suitable—that is where the ground is fairly

level and without a large proportion of stones. This implement can dig one turn in front of the gatherers, so keeping them continually supplied with potatoes. This reduces the chances of the gatherers having to stop work because the digger has become blocked with rubbish or stones. This digger has another advantage—two drills are swathed into one and this increases the number of potatoes that can be gathered in a day by roughly ten per cent.

Methods of Organisation

There are two alternative methods of arranging the piece-work gathering. The first has the advantage that it demands no additional equipment whatsoever. The gatherers simply pick into their sculls (light, oval-shaped, wire baskets) and the gang is paid as a unit on the basis of the acreage lifted. The method has the disadvantage that the gatherers have to be willing to " pull together " or make their own arrangements for the allocation of stents. Considering the small number of workers involved this should not be an insurmountable barrier. One modification that has been proposed to remove this barrier is that each gatherer should be paid on the basis of the total length of stent gathered in a day, but this has not been proved in practice as have the two major suggestions.

The second alternative is to get the gatherers to pick into barrels (or similar *rigid* containers such as oil drums) and to pay them according to the number of barrels filled. The method therefore demands a certain amount of expenditure on containers and also on loading equipment. The price of new 1½ cwt. wooden barrels, which will last for years, was 22s. 6d. each in 1956 whilst the price of second hand drums to hold 2¼ cwt. of potatoes will vary according to circumstances from 5s. to £1. The great advantage of this method of organisation is that the gatherers are paid individually on the result of their efforts and the potato foreman can from time to time adjust the length of stents given to the workers according to their ability. Against this must be set the fact that gathering into barrels adds roughly ten per cent to the work done by the gatherers and allowance has to be made for this in the payment given. The additional cost of loading equipment will be considered later.

Whether the acreage or the barrel method is used, the gatherers should be allowed to pick into whatever type of container they are used to. For several reasons the wire scull is the most suitable receptacle that is available. The gatherer can straddle it and gather with both hands all the potatoes within

easy reach. Buckets and baskets are higher from the ground and therefore cause the gatherer more work in lifting the potatoes and moving them to a point above the container. The brat (a sack tied round the waist and wrapped round one forearm) has some advantages but reduces the gatherer to working with one hand. It also needs emptying into some other receptacle which, of course, takes a certain amount of time that otherwise would be available for gathering. The wire scull is light in itself, easily filled and fairly easily lifted or carried when full.

The Basis of Payment

Incentive schemes, if they are to be successful, must be demonstrably fair to both sides—to the worker and to the farmer. This means that there should be a satisfactory physical basis for deciding appropriate rates of payment for different crops. It is also important to have the rate of payment linked to current day wages in such a manner that no recalculation of the basic information is needed when day wage rates change. In this way it is possible to have incentive schemes so designed that both sides can see clearly the reason for any adjustment that has to be made.

This is very necessary. A most unsatisfactory situation can develop if several farmers in the same area are setting piece-work rates on a more or less arbitrary basis. The gatherers may compare the rates on various farms without making any allowance for differences of conditions and certainly will compare earnings between gangs without making any allowance for differences of working ability. It is only too easy then to have competition between gangs of gatherers to increase earnings without any compensation being offered to the farmers in the form of greater productivity. Bad labour relations will follow, one side saying they are grossly underpaid and the other that the workers could work harder if they wanted.

Research has shown that the satisfactory physical basis, as far as potato gathering is concerned, is the number of potatoes that the gatherer has to pick. In other words, the time required for gathering a set stent increases as the number of potatoes in the drill increases. The same relationship holds irrespective of the size or weight of the potatoes and performance is the same behind a spinner as behind an elevator digger—provided the spinner is doing its job properly. The same gatherers will, therefore, take longer to gather a seed crop with a high number of small tubers than a ware crop with a smaller number of large tubers—irrespective of the tonnage per acre.

The remaining essential for a successful incentive scheme is the knowledge of what constitutes a satisfactory day's work when the workers are being paid on ordinary day rates. An examination of detailed time studies showed that whilst some gangs gathered for almost two-thirds of the time the digger was at work, the majority were working for less than half that time —and the digger was not working during " piece-times " ! It was agreed that a fair day-work basis was to expect the gatherers to work for fifty per cent of the time the digger was at work, that is for $3\frac{3}{4}$ hours in an eight-hour day. In practice most adult

POTATO GATHERING

INCENTIVE PAYMENT TO GANG OF GATHERERS

10 *Gatherers*   *One Row Digger*

8 *Hour Day*

WORK EXPECTATION

PROPORTION OF DIGGING TIME WORKED BY GATHERERS	DENSITY : NUMBER OF POTATOES IN 3 YARDS OF DRILL							
	120–116	115–91	90–73	72–61	60–51	50–43	42–36	35–30
	ACRES							
50 . .	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$
Expectation 75 . .	$1\frac{1}{2}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$2\frac{5}{8}$	3	$3\frac{3}{8}$	$3\frac{3}{4}$	$4\frac{1}{8}$
85 . .	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{1}{2}$	3	$3\frac{3}{8}$	$3\frac{7}{8}$	$4\frac{1}{4}$	$4\frac{5}{8}$

PAYMENT

BASIS : Day's Wage for working 50 per cent of digging time. Proportional extra payment for extra work.

i.e.—Payment for *each additional* $\frac{1}{4}$ *acre* as follows :—

Density .	120–116	115–91	90–73	72–61	60–51	50–43	42–36	35–30
Fraction of Day's Wage paid per $\frac{1}{4}$ acre .	1/4	1/5	1/6	1/7	1/8	1/9	1/10	1/11

gatherers could be expected to work for half as much time again as this, *i.e.* seventy-five per cent or nearly $5\frac{3}{4}$ hours, provided they were given sufficient incentive. Gatherers used to farm work should do even better, working for almost three-quarters as much again of the time.

The manner in which the number of potatoes to be gathered from the drills affects the acreage that ten gatherers can pick in a day is shown in the table opposite. The extreme variation (taking the 50 per cent level as satisfactory day work) is from one acre to $2\frac{3}{4}$ acres on day-work, the acreage varying according to the number of potatoes counted from 3 yards of drill. Payment follows from these basic physical expectations. If one acre can be gathered in a day at a day-work pace, then one acre is worth a day's wage and each quarter of an acre is worth a quarter of a day's work irrespective of how many are gathered. If the expectation is two acres at day-work pace, then each quarter acre earns an eighth of a day's wage.

It is worth noting in passing that a demonstrably fair incentive scheme pays an equal amount of money for an equal amount of work irrespective of whether it is the first quarter acre or the twelfth quarter acre. From the farmer's point of view there should be no objection to this because there is the assurance that for money paid there is a corresponding amount of work. Therefore, from what has been said already, the ordinary adult gatherer, given the necessary incentive, should earn a day's wage and a half in a day, whilst a gatherer accustomed to farm work should earn even more. The really skilled gatherer because she can also work faster than usual should earn two days' pay for one day's work.

To give an idea of what performances can be expected, a good crop of seed potatoes probably comes within the density of 73-90 potatoes per 3 yards of drill and a good ware crop in the 51-60 group. Taking the expectation on piece-work, ten gatherers should lift $2\frac{1}{4}$ acres and more with a seed crop and 3 acres at least with a ware one. For each quarter acre in these cases the gangs would receive 1/6th and 1/8th respectively of the total day wages for ten persons. This means that when day wages are £1 a day the gang's earnings should amount to at least £15 a day (or 30s. each) and probably will be more.

These examples are based on the use of the one row digger. An adjusted table is required for the two row digger because the work requirement is changed slightly by putting two drills into one. The count in this case must be from three yards of two adjacent drills which are equivalent to the one swath left by the digger.

As already mentioned, gathering into barrels increases some-what the work of the gatherers. This has to be allowed for in calculating the correct payment per acre and separate tables are necessary. An additional piece of information needed where barrels are used is the tonnage per acre of the crop, as lifted. This gives the number of any given size of barrel that has to be filled in gathering one acre. The correct payment per acre and the number of barrels per acre gives the appropriate payment per barrel. The kind of variation in payment that can result may be shown like this : Take two crops both yielding 12 tons of potatoes to the acre as lifted, the one a seed crop with a high count of potatoes and the other a ware crop with a lower count. Both are gathered into $1\frac{1}{2}$ cwt. barrels. On the basis of a day wage rate of £1 per day and a single row digger the seed crop may require a payment of $10\frac{1}{2}$d. per barrel and the ware crop one of 8d. per barrel.

Piece-Work Practice

The estimation of the number of potatoes per 3 yards of drill can be made by dividing the field into six approximately equal areas and taking a random sample of three yards of drill within each area. When barrels are being used the estimate of yield as lifted can be obtained at the same time by simply weighing the 3 yard stretches with a spring balance. If the crop appears very variable or the yield low, it would perhaps be preferable to divide into 9 instead of 6 approximately equal areas. Sections of a field that are obviously different in yield and which can be worked separately should be sampled and paid for separately. The random sample within each area should be made by throwing a suitable object and measuring from the point where it comes to rest. The three yards should be dug by hand and the number of potatoes counted (and, if necessary, also weighed). An average of all the results with 3 or 4 potatoes deducted from it to allow for loss in harvesting gives the required answer.

Piece-work gathering should remove much of the strain of potato harvesting which so often is caused by the effort to keep the gatherers at work. It does not remove responsibility for super-vision of the quality of the work. This remains the task of the farmer or his potato foreman. Full payment should depend on the attainment of the usual standard of the clean gathering of those potatoes which are exposed by the digger. If the digger is not uncovering the potatoes properly that is another matter, for piece-workers cannot be expected to scratch around for them. More attention has to be paid to the digger, making sure that it

is leaving a suitable swath of clearly visible potatoes. This also means that care must be taken to remove beforehand any weeds or shaws that are going to hinder the gatherers or interfere with the working of the digger.

For any job at the mercy of the weather and machinery breakdowns some adjustment must be practicable to the incentive rates to allow for situations out of the ordinary. It is possible to compensate the gatherers for breakdowns that prove an obvious hindrance to their chances of gaining the target by allowing them additional drills or barrels according to the length of the stoppage. A somewhat similar compensation is required in bad harvest weather when the potatoes are difficult to dig and not easy to see on the ground. This requires a judgment taken on each specific instance with a knowledge of the capacity of gangs working on incentive rates and an appreciation of the effect of the conditions on the picking speed of the actual gang. Such decisions must be taken on the spot and each constitutes a temporary arrangement for the particular unfavourable conditions at that time.

The simplest way to adjust for poor conditions is to allow additional drills or barrels on the basis, to give an example, of one drill extra for each 9 drills gathered. It is important to note that this avoids making any change in the basic rate of payment. Naturally it pays to be conservative in giving such allowances— otherwise too much incentive is removed, particularly when the number of potatoes per yard of drill is low. An increase of the order of 1 for 9 is equivalent to assuming that if the gang were expected to pick 2 acres all-told in the day, their output would be less by a fifth of an acre through no fault of their own.

When conditions become unsuitable for gathering both work and payment should cease. The piece-work rate has been set at a level that provides compensation for this weather risk. There is one probable exception and that is where gangs are travelling from a distance. Then it may be necessary to guarantee them at least half a day's wage (not piece-work earnings) even if conditions prevent them working.

Loading and Carting

The use of barrels or " oil " drums for collecting potatoes results automatically in changes in the organisation of the loading and carting and to a certain extent of the storage of the potatoes. Wooden barrels can be loaded on to trailers by means of a metal grab and hydraulic hoist worked by the hauling tractor. The full barrels are then transported for emptying at the pit or shed.

Three men are needed for the loading : the tractor driver, a man on the trailer arranging the barrels and a man placing the grab over the barrels. This latter man also gives the gatherer a ticket as a receipt for the barrel.

The heavier " oil " drums are emptied into the trailers, using one mechanical method or another, and the potatoes carted loose. In one example a mechanical shovel was fitted to a fore-mounted hydraulic loader. Two men tipped a drum into this shovel and the driver of the loader emptied its contents into the accompanying trailer. Four men were therefore required to-gether with a special tractor for the loading device. An alternative method again used a fore-mounted loader, this time to drop a frame over the drum in order to lift and empty it. This method therefore reduced the manpower required by one, needing only two tractor drivers at any particular time, but a separate man was required to distribute the tickets.

In contrast, when the gang is gathering into sculls on the acreage basis there is no need for a change from the normal arrangements of loading by hand. At the time of writing this is still the most satisfactory method of loading potatoes, although considerable developments can be expected in mechanical loading. The main point to remember is that the hand loading must be done from behind the gatherers so that there will be no chance at all of the trailer getting in the way of the digger. A minimum of two men are required to each load, one loading and one driving the tractor. To avoid tiring out one man the trailer should preferably be a low one and the tractor driver (or drivers) should take a turn with the lifting and emptying whilst the other man drives the tractor.

Unloading loose potatoes from the trailers will be according to usual practices but some alterations are desirable where the full barrels are transported. At the shed the barrels can be unloaded directly from the trailer into the elevator with the aid of a simple frame fitted across the mouth of the hopper. This holds them in position whilst they are being emptied. At a pit the work can be reduced by the use of a mould. This consists of two boards, 9 ft. × 4 ft. 6 in. for example, which form the sides of the pit and are clamped apart at the top by extensions of the end-pieces. Two sets of boards are required, the one fitting by latches into its place against the previous set. This means that whilst one mould is being filled the other can be moved and clamped into position. The potatoes are poured into the open space between the boards and the mould forms the pit-sides, no other shaping of the pit being required.

Usually two men are used for unloading the barrels. Both

will need an empty space on the side of the trailer in which they can stand to start work. The man who is loading in the field will need to bear this in mind. Another point, particularly relevant where the potatoes are pitted, is that the man unloading at the back of the trailer can always drop the first few empty barrels off the trailer out of his way and pick them up afterwards. It is not so easy for the man at the front. One possibility is to provide him with a raised platform (like that on a milk lorry) jutting out over the front of the trailer and on this he can place some of the empty barrels.

Two trailers are the most likely requirement for piece-work gathering with a gang of ten. Supposing that three acres have to be carted in the day using the common methods of loading and pitting, two trailers of 20 to 25 cwts. are adequate. For shed storage, because of the greater hauling distances the trailers need to be somewhat larger. There will be some instances where one trailer will suffice but either the output must be small or the pit very close at hand.

The position is somewhat similar where drums are emptied into the trailers, but it is advisable to have larger trailers so that 20 drums holding 45 cwts. can be transported at the same time. Opportunities to use only one trailer may arise slightly more frequently than with hand loading, but generally this will only happen when the output of the gang is in the region of only two acres a day—which can occur with a seed crop having a high count of potatoes.

When barrels are transported to the pit or shed the situation depends considerably on the size of the trailer. A large trailer fitted with extended sides can hold 30 barrels of $1\frac{1}{2}$ cwts. and in this case performance will be similar but not quite so good as with the drums. When smaller trailers are used, holding 20 barrels, there usually needs to be at least two of them, and three small trailers are generally the rule for shed storage.

The number of barrels or drums that are needed for the gangs depends on the system of transport. Where "oil" drums are emptied into the trailers a gang of ten will usually require twenty drums, provided ten drums are emptied at a time as soon as they are filled. In the case of the wooden barrels more are needed because they are transported away from the gatherers. Fifty barrels, five to each gatherer, must be considered the normal requirement. It must be realised, however, that for long hauls to shed storage additional haulage capacity may be needed and therefore more barrels.

This means that for the barrel method in particular a certain amount of capital investment is required. Fifty barrels at 1956

prices with two hydraulic hoists for the tractors works out at around £120. Against this must be set the definite advantage that carting the potatoes to the place of storage in the barrels reduces the number of opportunities for damaging the potatoes.

Final Note

A factor of major importance when starting piece-work gathering is to employ a small gang of gatherers. That in itself will increase the amount of work done by each gatherer. There is no reason why a gang as small as 6 persons should not be used if that is the number available. Ten gatherers can be set as the optimum for most conditions. Many more gatherers than this may bring trouble since there is the danger that the gang may be able to gather more acres in a day than the digger can dig. This lowers the amount of work done by each gatherer and so automatically lowers their earnings. Alternatively, to avoid this happening the digger has to speed up its pace with a consequent marked increase in the damage to the potatoes. The best advice then is to aim at a gang of between 8 and 10 gatherers for ware crops and at one of 10 to 12 gatherers for seed crops, which generally have more but smaller tubers.

When piece-work gathering is first undertaken on a farm some snags are bound to arise but that is common to any farming operation. Most will disappear when the system has been tried. As stated already, piece-work will not necessarily cut costs though in many instances it will be cheaper because of the indifferent labour now available on day rates. What piece-work is designed to do, and will do, is to make full use of the available adult labour force and to make certain that payment to the gatherers fits performance.

TABLE 1

WORK EXPECTATION

(a) DAY WORK GATHERING

Gang of 10   *Working 50 per cent of Time Digger at Work*

Gathering into SCULLS only

	NUMBER OF POTATOES IN 3 YARDS OF SWATH										
ONE ROW DIGGER .	120–116	115–91	90–73	72–61	60–51	50–43	42–36	35–30			
TWO ROW DIGGER * .		240–214	213–170	169–144	143–125	124–109	108–96	95–86	85–77	76–70	69–64
Acreage in Day of 8 hours .	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½

Gathering into BARRELS

	NUMBER OF POTATOES IN 3 YARDS OF SWATH									
ONE ROW DIGGER .	120–104	103–81	80–65	64–53	52–44	43–37	36–30			
TWO ROW DIGGER* .	240–232	231–186	185–153	152–130	129–112	111–97	96–86	85–76	75–68	67–62
Acreage in Day of 8 hours . .	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼

* Swath from two adjacent drills.

(b) PIECE-WORK GATHERING

PROPORTION OF DIGGING TIME WORKED BY GATHERERS	GANG OF 10										
	ACRES IN DAY OF 8 HOURS										
50 (as above) . .	1	1¼	1½	1¾	2	2¼	2½	2¾†	3†	3¼†	3½†
Expectation—											
75	1½	1⅞	2¼	2⅝	3	3⅜	3¾	4⅛	4½	4⅞	5¼
85	1¾	2⅛	2½	3	3⅜	3⅞	4¼	4⅝	5	5½	6

† Two Diggers are definitely needed for these low counts (low yields).

TABLE 2

INCENTIVE PAYMENT TO GANG

SUM PAID PER ¼ ACRE

DIGGER	NUMBER OF POTATOES IN 3 YARDS OF SWATH											
ONE ROW {	120–116	115–91	90–73	72–61	60–51	50–43	42–36	35–30				
TWO ROW* {		240–214	213–170	169–144	143–125	124–109	108–96	95–86	85–77	76–70	69–64	63–58
DAY WAGE RATE	PAYMENT TO GANG IN SHILLINGS AND PENCE											
Shillings	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
16	40 0	32 0	26 8	22 10	20 0	17 9	16 0	14 6	13 4	12 4	11 5	10 8
17	42 6	34 0	28 4	24 4	21 3	18 11	17 0	15 5	14 2	13 1	12 2	11 4
18	45 0	36 0	30 0	25 8	22 6	20 0	18 0	16 4	15 0	13 10	12 10	12 0
19	47 6	38 0	31 8	27 2	23 9	21 1	19 0	17 3	15 10	14 7	13 7	12 8
20	50 0	40 0	33 4	28 7	25 0	22 3	20 0	18 2	16 8	15 5	14 3	13 4
21	52 6	42 0	35 0	30 0	26 3	23 4	21 0	19 1	17 6	16 2	15 0	14 0
22	55 0	44 0	36 8	31 5	27 6	24 5	22 0	20 0	18 4	16 11	15 9	14 8
23	57 6	46 0	38 4	32 10	28 9	25 7	23 0	20 11	19 2	17 8	16 5	15 4
24	60 0	48 0	40 0	34 4	30 0	26 8	24 0	21 10	20 0	18 6	17 2	16 0
25	62 6	50 0	41 8	35 8	31 3	27 9	25 0	22 9	20 10	19 3	17 10	16 8
26	65 0	52 0	43 4	37 2	32 6	28 11	26 0	23 8	21 8	20 0	18 7	17 4
27	67 6	54 0	45 0	38 7	33 9	30 0	27 0	24 6	22 6	20 9	19 3	18 0
28	70 0	56 0	46 8	40 0	35 0	31 1	28 0	25 5	23 4	21 6	20 0	18 8
29	72 6	58 0	48 4	41 5	36 3	32 3	29 0	26 4	24 2	22 4	20 9	19 4
30	75 0	60 0	50 0	42 10	37 6	33 4	30 0	27 3	25 0	23 1	21 5	20 0
31	77 6	62 0	51 8	44 4	38 9	34 5	31 0	28 2	25 10	23 10	22 2	20 8
32	80 0	64 0	53 4	45 8	40 0	35 7	32 0	29 1	26 8	24 7	22 10	21 4
33	82 6	66 0	55 0	47 2	41 3	36 8	33 0	30 0	27 6	25 5	23 7	22 0
34	85 0	68 0	56 8	48 7	42 6	37 9	34 0	30 11	28 4	26 2	24 3	22 8
35	87 6	70 0	58 4	50 0	43 9	38 11	35 0	31 10	29 2	26 11	25 0	23 4
36	90 0	72 0	60 0	51 5	45 0	40 0	36 0	32 9	30 0	27 8	25 9	24 0

* The swath left by a two row digger is from two adjacent drills, hence the number of potatoes per 3 yards is greater.

TABLE 3

DRILLS PER ACRE*

LENGTH OF DRILL	DRILLS PER ACRE	DRILLS PER ¼ ACRE
yards		
622	10	$2\frac{1}{2}$
519	12	3
445	14	$3\frac{1}{2}$
389	16	4
346	18	$4\frac{1}{2}$
311	20	5
283	22	$5\frac{1}{2}$
259	24	6
239	26	$6\frac{1}{2}$
222	28	7
208	30	$7\frac{1}{2}$
195	32	8
183	34	$8\frac{1}{2}$
173	36	9
164	38	$9\frac{1}{2}$
156	40	10
148	42	$10\frac{1}{2}$
141	44	11
135	46	$11\frac{1}{2}$
130	48	12
125	50	$12\frac{1}{2}$
120	52	13
115	54	$13\frac{1}{2}$
111	56	14
107	58	$14\frac{1}{2}$
104	60	15
100	62	$15\frac{1}{2}$

* Taken as 6,223 yards of drill equals one acre (*i.e.*, 28-inch drills). No adjustment is needed to tables for different widths of drill.

TABLE 4

Calculation of Incentive Payment to Individual—Barrel Method
Sum Paid to Gatherer per 1/40th Acre

(a) Single-Row Digger

Day Wage Rates Shillings	Number of Potatoes in 3 Yards of Drill																		Day Wage Rates Shillings
	120–116	115–111	110–106	105–101	100–96	95–91	90–86	85–81	80–76	75–71	70–66	65–61	60–56	55–51	50–46	45–41	40–36	35–31	
	Payment *in Pence*																		
16	47	46	44	42	41	39	37	36	34	32	31	29	27	26	24	23	21	19	16
17	50	48	47	45	43	42	40	38	36	34	33	31	29	27	25	24	22	20	17
18	53	51	50	48	46	44	42	40	38	37	35	33	31	29	27	25	23	21	18
19	56	54	52	50	48	47	45	43	40	39	36	34	32	31	29	26	25	23	19
20	60	57	55	53	51	49	47	45	42	40	38	36	34	32	30	28	26	24	20
21	61	60	58	56	53	51	49	47	45	43	40	38	36	34	32	29	27	25	21
22	65	63	61	58	56	54	52	49	47	45	42	40	38	35	33	31	29	26	22
23	69	66	63	61	58	56	54	51	49	47	44	42	39	37	34	32	30	27	23
24	71	69	66	64	61	59	56	54	51	49	46	43	41	39	36	33	31	29	24
25	74	71	69	66	63	61	58	56	53	51	48	45	43	40	38	35	32	30	25
26	77	74	71	69	66	64	61	59	55	53	50	47	44	42	39	36	34	31	26
27	80	77	74	71	69	66	63	60	57	55	52	49	47	44	41	38	35	32	27
28	83	80	77	74	71	68	66	63	59	57	54	51	48	45	42	39	36	33	28
29	86	83	80	77	74	71	68	65	61	59	56	52	49	47	43	40	38	34	29
30	89	86	82	79	76	73	70	67	64	61	57	54	51	48	45	42	39	36	30
31	92	89	85	82	79	76	72	69	67	63	60	56	53	50	46	43	40	37	31
32	95	91	88	85	81	78	75	71	68	65	61	58	55	51	48	45	41	38	32
33	98	94	91	87	84	81	77	74	70	67	63	60	56	53	50	46	43	39	33
34	101	97	93	90	87	83	80	76	72	69	65	61	59	55	51	47	44	41	34
35	104	100	96	93	89	86	82	78	74	71	67	63	60	56	52	49	46	42	35
36	107	103	99	95	92	88	84	80	77	73	69	65	61	59	54	50	47	43	36

TABLE 5

Calculation of Incentive Payment to Individual—Barrel Method
Sum Paid to Gatherer per 1/40th Acre

(b) Double Row Digger

Day Wage Rates Shillings	Number of Potatoes in 3 Yards of Swath*																		Day Wage Rates Shillings
	240–231	230–221	220–211	210–201	200–191	190–181	180–171	170–161	160–151	150–141	140–131	130–121	120–111	110–101	100–91	90–81	80–71	70–61	
	Payment in Pence																		
16	43	42	40	38	37	35	33	32	30	28	27	25	23	22	20	18	17	15	16
17	46	44	42	41	39	37	35	34	32	30	28	27	25	23	21	19	18	16	17
18	49	47	45	43	41	39	38	36	34	32	30	28	26	24	22	21	19	17	18
19	52	49	47	46	44	41	40	38	36	34	32	30	28	26	24	22	21	18	19
20	54	52	50	48	46	44	42	40	37	35	33	31	29	27	25	23	22	19	20
21	57	55	52	50	48	46	44	42	39	37	35	33	30	28	26	24	23	20	21
22	60	57	55	53	50	48	46	44	41	39	37	34	32	30	27	25	24	21	22
23	62	60	57	55	53	50	48	46	43	41	38	36	33	31	29	26	25	22	23
24	65	63	60	58	55	52	50	48	45	42	40	37	35	32	30	27	26	22	24
25	68	65	62	60	57	55	52	50	47	44	42	39	36	34	31	29	27	23	25
26	71	68	65	62	60	57	54	51	49	46	43	41	38	35	32	30	28	24	26
27	73	70	67	65	62	60	56	53	51	48	45	42	39	36	34	31	29	25	27
28	76	73	70	67	64	61	58	55	52	49	47	44	41	38	35	32	30	26	28
29	78	76	72	70	67	63	61	58	54	51	48	46	42	39	36	33	31	27	29
30	81	78	75	72	69	66	63	60	56	53	50	47	44	41	38	34	32	28	30
31	84	81	77	74	71	68	65	61	58	55	52	48	45	42	39	35	33	29	31
32	86	84	80	77	73	70	67	63	60	57	53	50	47	43	40	36	34	30	32
33	89	86	82	79	76	72	69	65	62	59	55	52	48	44	41	38	36	31	33
34	92	88	85	82	78	74	71	67	64	60	57	53	49	45	43	39	37	32	34
35	95	91	87	84	80	76	73	69	66	62	58	55	51	47	44	40	38	33	35
36	97	94	90	86	83	79	75	71	67	63	60	56	52	48	45	41	39	34	36

* One swath of the digger is formed by two adjacent drills.

TABLE 6

INCENTIVE PAYMENT TO INDIVIDUAL

BARREL METHOD

NUMBER OF BARRELS REQUIRED PER 1/40TH ACRE

POTATOES IN 3 YARDS OF DRILL* BY WEIGHT	APPROXIMATE TONAGE OF POTATOES TO BE GATHERED PER ACRE	NUMBER OF BARRELS TO HOLD POTATOES FROM 1/40TH ACRE		
lbs.	tons	$1\frac{1}{4}$ cwt. Barrels	$1\frac{1}{2}$ cwt. Barrels	$2\frac{1}{4}$ cwt. Drums
4	4	$1\frac{1}{2}$	$1\frac{1}{2}$	1
5	5	2	$1\frac{1}{2}$	1
6	6	2	2	$1\frac{1}{2}$
7	6	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$
8	7	3	$2\frac{1}{2}$	$1\frac{1}{2}$
9	8	$3\frac{1}{2}$	3	2
10	9	$3\frac{1}{2}$	3	2
11	10	4	$3\frac{1}{2}$	$2\frac{1}{2}$
12	11	$4\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$
13	12	5	4	3
14	13	5	$4\frac{1}{2}$	3
15	14	$5\frac{1}{2}$	$4\frac{1}{2}$	3
16	15	6	5	$3\frac{1}{2}$
17	16	$6\frac{1}{2}$	5	$3\frac{1}{2}$
18	17	$6\frac{1}{2}$	$5\frac{1}{2}$	4
19	18	7	6	4
20	19	$7\frac{1}{2}$	6	4
21	19	8	$6\frac{1}{2}$	$4\frac{1}{2}$
22	20	8	7	$4\frac{1}{2}$
23	21	$8\frac{1}{2}$	7	5
24	22	9	$7\frac{1}{2}$	5

* 3 yards of drill as grown.