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*File Potato*

C O S T S   O F   O P E R A T I N G  
P O T A T O   S P R A Y   R I N G S ,   I N   1 9 4 4

CONTENTS

	<u>Page</u>
Size of Spray Rings - - - - -	2
Labor and Equipment - - - - -	2
Materials Used - - - - -	3
Operating Costs - - - - -	4
Acres Sprayed and Costs - - - - -	5
Suggestions for New Rings - - - - -	7

S.W. Warren & L.B. Darrah

Department of Agricultural Economics  
New York State College of Agriculture

COSTS OF OPERATING POTATO SPRAY RINGS IN 1944

This report summarizes the costs of operating 22 potato spray rings in 1944.

A total of 70 custom-operated spray rings were in operation in 1944.

These were organized as follows:

1940 .....	2 rings
1941 .....	10 rings
1942 .....	5 rings
1943 .....	18 rings
1944 .....	35 rings

Total	70 rings
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These 70 rings covered slightly more than one-eighth of the potato acreage in upstate New York in 1944.

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The spray ring operators who furnished the information used in this report were:

Vernon Aldrich, Erie Co.	M.J. Haskins, Chautauqua Co.
Walter J. Babbitt, Allegany Co.	Francis L. Jones, Cortland Co.
William W. Ballagh, Jefferson & Lewis Cos.*	Clifford Lester, Cattaraugus Co.
Sumner Bates, Erie Co.	Harry Luders, Erie Co.
Allen Briggs, Chautauqua Co.	Walter Pendleton, Allegany Co.
George Bull & Son, Cortland Co.	Maurice Phelps, Erie Co.
Avery W. Capwell, Genesee Co.	Lewis Rashford, Oneida Co.
Orville Engst, Onondaga Co.	Lloyd P. Smith, Oneida Co.
Donald Erkenbeck, Onondaga Co.	Bernard Stamper, Erie Co.
Arthur Genung, Allegany Co.	Lester Tinch, Erie Co.
DeForest Genung, Allegany Co.	Robert Windus, Allegany Co.
G.L.F. (M.L. Dake), Cortland Co.	

The writers wish to acknowledge the assistance of the County Agricultural Agents in the above mentioned counties, and the assistance of Mr. E.S. Shepardsen of the Agricultural Engineering Department at Cornell University.

\* Report received too late to be included in this summary, except figure 1.

SIZE OF SPRAY RINGS

The spray rings had an average of 44 growers. The number of growers per ring ranged from 18 to 72. The acreage of potatoes per grower averaged 5.5, but varied from 2.6 in each of two rings to 12.8 in one ring.

The total acreage of potatoes per ring ranged from 144 to 332 and averaged 243.

TABLE 1.

SIZE OF SPRAY RINGS  
22 Spray Rings, New York, 1944

Item	Average of 22 rings	Your ring
Number of growers	44	_____
Acres of potatoes per grower	5.5	_____
Acres of potatoes per spray ring	243	_____
Average times sprayed	6.7	_____
Total acres sprayed	1623	_____

The number of times each acre was sprayed averaged 6.7. In one ring, only 4.7 sprays were applied while in another ring 9 sprays were applied.

LABOR AND EQUIPMENT

The operation of a custom spray ring required an average of two men for a period of three months each. The total amount of labor used varied from about 4 months to 9 months. In addition to the actual spraying, some of the labor was spent in overhauling the equipment at the end of the spraying season.

TABLE 2.                      LABOR AND EQUIPMENT  
22 Spray Rings, New York, 1944

Item	Average of 22 rings	Your ring
Months of labor	6.0	_____
Original cost of equipment	\$3385	_____
Percentage of original cost charged to spray ring	86	_____
Amount of original cost charged to spray ring	\$2899	_____

Since some of the operators used their trucks and tractors for other purposes, only 86 per cent of the investment in equipment was charged to spraying. Only about one-third of the operators used their equipment entirely for spraying purposes.

#### MATERIALS USED

The amount of lime and copper sulphate used was in excess of recommendations. This probably was accounted for by materials wasted, a few repeat sprayings with no extra charge, possible errors in acreage, and a desire on the part of the operators to do a satisfactory job.

TABLE 3.                      MATERIALS USED PER ACRE  
22 Spray Rings, New York, 1944

Item	Average of 22 rings	Your ring
Lime	11 lbs.	_____
Copper sulphate	11 lbs.	_____
Gasoline	0.8 gals	_____

OPERATING COSTS

To place the rings on a comparable basis, all labor was charged at the rate of \$150 per month. The charge for the use of equipment for the year was one-third of the portion of the original cost which was charged to the spray ring. This charge covers interest on the investment, as well as depreciation.

TABLE 4. OPERATING COSTS  
22 Spray Rings, New York, 1944

Item	Total cost		Cost per acre	
	Average of 22 rings	Your ring	Average of 22 rings	Your ring
Labor (at \$150 per month)	\$900	_____	\$0.55	_____
Use of equipment	966	_____	.59	_____
Repairs and maintenance	158	_____	.10	_____
License and tax on truck	42	_____	.03	_____
Insurance on equipment	47	_____	.03	_____
Spray materials	1114	_____	.69	_____
Gas, oil, and grease	256	_____	.16	_____
Other items	39	_____	.02	_____
Total	\$3522	_____	\$2.17	_____

Spray materials, use of equipment and labor were the most important cost items. Together, they accounted for 84 per cent of the total operating cost.

ACRES SPRAYED AND COSTS

To determine the relation between acres sprayed and total costs, the spray rings were divided into three groups. The 10 smallest rings varied from 930 to 1363 acres, and averaged 1180 (table 5). The seven medium-sized rings varied from 1545 to 1830 acres and averaged 1700, while the five largest rings varied from 2078 to 2976 acres and averaged 2403.

A comparison of the small and large rings indicates that the increased size was the result of a combination of more acres and more sprays.

The large rings did more than twice as much spraying as the small rings, but required only one-fourth more labor.

TABLE 5. RELATION OF TOTAL ACRES SPRAYED TO VARIOUS FACTORS  
22 Spray Rings, New York, 1944

Item	10 rings with low acreage	7 rings with medium acreage	5 rings with high acreage
Number of growers	41	39	55
Acres of potatoes per grower	5.1	6.2	5.7
Acres of potatoes per ring	209	242	311
Average times sprayed	5.6	7.0	7.7
Total acres sprayed	1180	1700	2403
Months of labor	5.7	5.8	7.0
Original cost of equipment	\$3446	\$3347	\$3319
Amount of original cost charged to spray rings	\$2904	\$2988	\$2765

The total cost of operating rings with large acreages averaged \$4369 (table 6). This was only 40 per cent more than the cost of operating the small rings which did less than half as much spraying. About three-fourths of the increased cost of operating large rings was for spray materials.

TABLE 6. RELATION OF TOTAL ACRES SPRAYED TO TOTAL COSTS  
22 Spray Rings, New York, 1944

Item	Total Cost		
	10 rings with low acreage	7 rings with medium acreage	5 rings with high acreage
Labor (at \$150 per month)	\$855	\$870	\$1050
Use of equipment (1/3 of original cost)	968	996	922
Repairs and maintenance	138	157	201
License and tax on truck	42	44	39
Insurance on equipment	44	57	38
Spray materials	843	1070	1719
Gas, oil, and grease	231	235	334
Other items	33	26	66
Total	\$3154	\$3455	\$4369



In general, the larger the acreage of potatoes sprayed per ring the lower the cost of spraying per acre (table 7 and figure 1). If the acreage of your ring is small, additional acres sprayed will reduce the cost considerably. However, if your spray ring is medium sized, a further increase in acres sprayed will reduce the costs per acre only moderately.

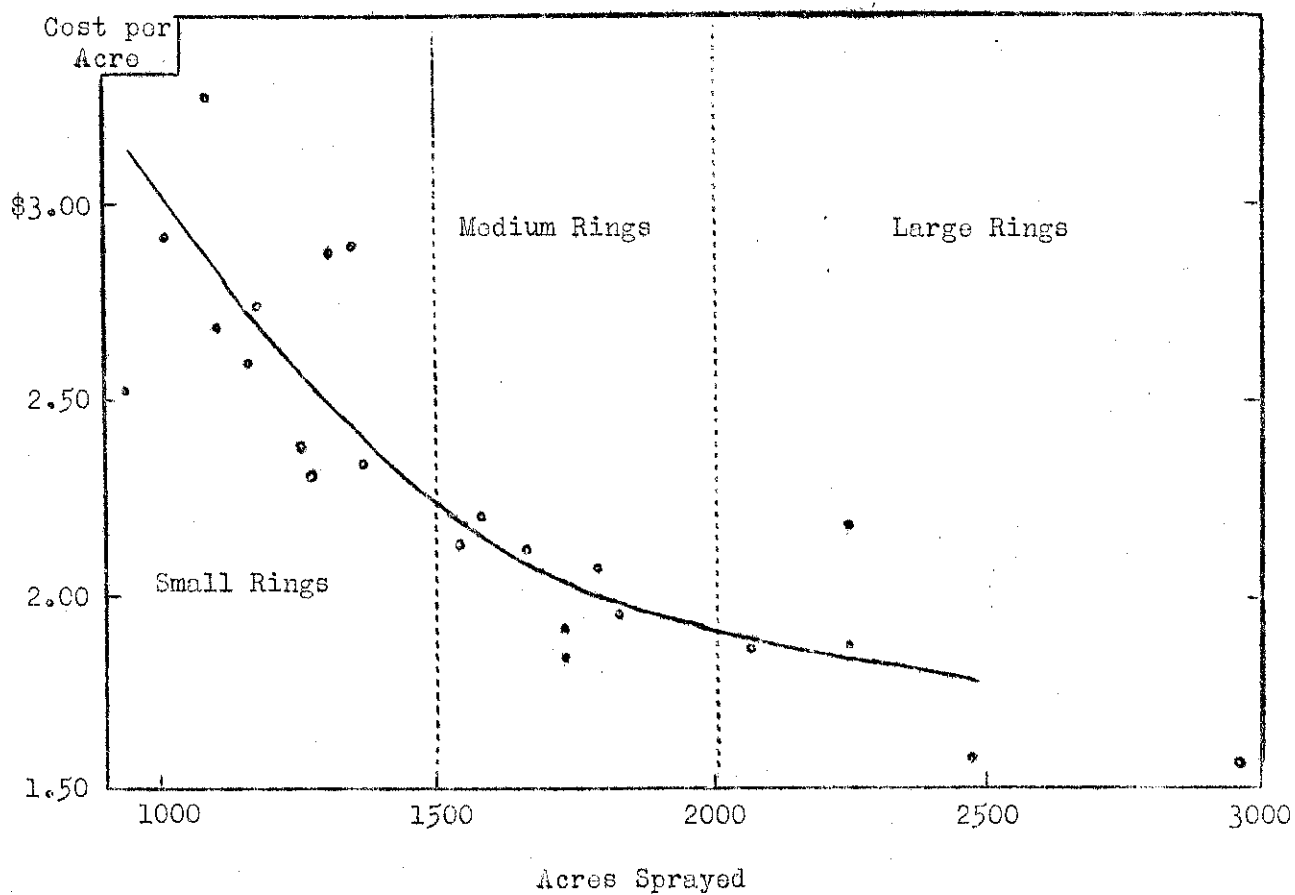
TABLE 7. RELATION OF TOTAL ACRES SPRAYED TO COSTS PER ACRE  
22 Spray Rings, New York, 1944

Item	Cost per acre		
	10 rings with low acreage	7 rings with medium acreage	5 rings with high acreage
Labor	\$0.72	\$0.51	\$0.44
Use of equipment	.81	.58	.38
Repairs and maintenance	.12	.09	.08
Licence and tax on truck	.04	.03	.02
Insurance on equipment	.04	.03	.02
Spray materials	.71	.63	.71
Gas, oil, and grease	.20	.14	.14
Other items	.03	.02	.03
Total	\$2.67	\$2.03	\$1.82

#### SUGGESTIONS FOR NEW RINGS

If you are planning to establish a new ring: (1) estimate the total acreage which will be sprayed, (2) refer to figure 1 of this report to see about what the cost per acre will be for the volume of business expected, and (3) set your rate per acre high enough to cover costs and to encourage good service.

FIGURE 1. RELATION OF ACRES SPRAYED TO COST PER ACRE  
23 Spray Rings, New York, 1944



How do your costs compare with others spraying the same acreage?