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UNIVERSITY OF MINNESOTA
Department of Agriculture

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TRACTOR COSTS AND RATES OF PERFORMANCE

A preliminary report of data secured in 1941 covering
the cost of operation and the rate of performance
on farm tractors in Minnesota and a
Summary for the 3-year period, 1939-1941

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TRACTOR COSTS AND RATES OF PERFORMANCE 1/

Source of Data

For the past 3 years a group of tractor operators have submitted to the Minnesota Agricultural Experiment Station cost and performance data covering their tractors. Complete annual records were obtained covering 92 tractors of which 42 were for 1939, 26 for 1940, and 24 for 1941. In this report each year's record has been considered as a separate item even though the same tractor may be included in each of the 3 years. Since the data secured in 1939 and 1940 have already been published 2/, the only individual year records in this report are those for 1941. Data for the first two years are shown only in the 3 year summaries.

The number of records by make and model of tractor is as follows:

John Deere A.....	12	Allis-Chalmers U.....	2
Allis-Chalmers, W.C.,.....	10	Case C.C.....	2
McCormick-Deering F12.....	10	John Deere D.....	2
McCormick-Deering F20.....	10	McCormick-Deering 15-30.....	2
John Deere B.....	8	McCormick-Deering H.....	2
Allis-Chalmers B.....	6	Case S.C.....	1
John Deere G.P.....	6	Case D.C.....	1
McCormick-Deering F14.....	5	Caterpillar 30.....	1
Case L.....	3	McCormick-Deering F30.....	1
McCormick-Deering M.....	3	McCormick-Deering W.K.....	1
Oliver 70.....	3	Mpls-Moline-M.T.A.....	1

Eighty per cent of these tractors were of the general purpose type and 75 per cent were equipped with rubber tires. The average age was a little over 4 years. The average estimate of the operators as to the total length of life was 11 years for the tractors and 7½ years for the rubber tires. The drawbar horsepower ratings of these tractors as indicated by the University of Nebraska tests varied from 9.28 to 28.34. In order to make comparisons within similar size groups and between groups, all tractors have been divided into the following 3 groups based on the Nebraska ratings, - small tractors, 5.50 to 11.99 h.p., medium tractors 12.00 to 18.40 h.p., and large tractors, 18.50 to 31.49 h.p.,3/

1/ Completion of this project was made possible by workers supplied in Official Project No. 265-1-71-236, Work Projects Administration, Sub-project No. 469. Sponsor: University of Minnesota.

2/ Mimeographed Report No. 118. Division of Agricultural Economics University of Minnesota June 1940.
Mimeographed Report No. 122. Division of Agricultural Economics University of Minnesota April 1941.

3/ The small and medium tractor groups correspond to Groups I and II as reported in Mimeographed Reports 118 and 122 mentioned in footnote 2. The large tractor group represents a combination of Groups III and IV in these reports. Since most of the tractors in Group III lie close to the upper limit of the class and most of these in Group IV lie close to the lower limit of that class the difference in average horsepower was insufficient to justify two classifications.

Cost of Tractor Operation

The average cost per hour of operating tractors in each size group in 1941 is shown in Table 1. Fuel, lubricants, and cash repair items are charged at the purchase price. Man labor spent in servicing and repairing is charged at 25 cents per hour. Annual depreciation is computed by dividing the purchase price of the tractor by the farmer's estimate of the years it would last. Interest is charged at 6 per cent of the average valuation for the year.

Table 1.
Average Cost per Hour of Operating Tractors by Size Groups - 1941

Size Group	Small	Medium	Large
Drawbar horsepower group	5.50-11.99	12.00-18.49	19.00-31.49
Average horsepower per tractor	10.49	15.67	25.29
Number tractors	7	13	4
Operating costs			
Fuel	.150	.180	.273
Lubricants	.014	.022	.032
Labor	.013	.013	.022
Cash repairs	.013	.016	.009
Total	.190	.231	.336
Fixed charges			
Depreciation	.137	.151	.336
Interest @ 6% of average value	.063	.055	.134
Total	.200	.206	.470
Total cost per hour	.390	.437	.806
Range in cost per hour	.375 - .461	.311 - .592	.459 - 1.579
Hours of work per year, average	574	757	509
Range in hours of work per year	332 - 753	399 - 1506	100 - 806
Labor and materials per 100 hours			
Servicing, hours	4.4	4.0	5.5
Repairing, "	1.1	1.8	3.3
Fuel, gallons, total	124	160	234
" " , range	81 - 150	124 - 208	204 - 314
Cylinder oil, gallons	1.9	3.1	2.6

There is a wide range in cost per hour within each size group. This same range was observed in case of the records for 1939 and 1940. One important factor affecting the cost per hour is the numbers of hours a tractor is used during the year. The effect of this factor is shown in Table 2 for medium size tractors for the 3-year period. Operating costs vary almost directly with the number of hours of use so that the cost per hour of this item is fairly constant regardless of the hours of annual use. The fixed charges tend to be relatively

constant for the year and hence the cost per hour varies inversely with the hours of use. The slightly higher operating cost for the tractors used less than 600 hours per year was due to the fact that a larger proportion of the work was plowing and other heavy draft operations than was the case with the tractors that were used more.

Table 2.
Effect of Annual Hours of Use on Cost per Hour of
Operating Medium Size Tractors, 1939-1941.

Annual hours of Use	Number Tractors	Average Hours of Use	Cost per Hour		
			Operating	Fixed	Total
Under 600	14	458	\$.267	\$.330	\$.597
600 - 800	20	853	.243	.192	.435
over 800	11	1044	.237	.177	.414

Another factor affecting the cost of tractor operation is the proportion of the full horsepower capacity that is utilized. The average horsepower rating of the large tractors was 25.29, but at some types of work they operated machines of the same size as the group of small tractors and at little if any greater speed. Tractors in the other size groups were also often operated at considerably below capacity. This is reflected in the range in gallons of fuel consumed. Four tractors with the heaviest fuel consumption in the small group used more fuel per hour than the tractors in the medium group with the lowest fuel consumption. One of the medium size tractors used more fuel per 100 hours than reported for two of four large tractors. This matter of the proportion of capacity at which a tractor is operated and its effect on cost will be discussed later in this report.

The kind of fuel used and the price per gallon were important factors causing variations in operating costs. Of the 24 tractors in 1941, gasoline was used as fuel exclusively in 11, some lower grade fuel with gasoline only for starting in 8, and both gasoline and low grade fuel in 5. The lower grade fuels were reported as tractor fuel, distillate, and crude petroleum, and the price varied from 8.3 cents to 10.5 cents per gallon with 8.9 cents the average price. The average price paid for gasoline was 13.5 cents, and the range was from 11 cents to 18 cents. The average fuel cost per gallon for all tractors in 1941 was 11.4 cents and varied from 9.4 cents and 17.0 cents among the different tractors. There was a considerable variation in the quantities of lubricants used. Repair costs also vary widely since some tractors may require very little repairing in a particular year while others require the replacement of expensive parts or a complete overhauling.

The cost of operating all of the tractors included in this study for the years 1939, 1940, and 1941 is presented in Table 3. The average cost for each size group is shown. These average costs do not vary greatly from those shown in Table 2 but the larger number of tractors covered make them a more reliable base for cost comparisons among the different size groups. The hours of use per year for the medium size tractor is so much larger than for the other groups that the costs per hour are relatively lower. In order to get a more fair comparison among the 3 size groups a constant number of hours, the average for all tractors was used as the basis for distributing the fixed charges. This adjustment eliminates at least roughly the advantage of longer hours of use for the medium tractors in the unadjusted computation. In order to reduce these hourly costs to a comparable unit, they have been divided by the average drawbar horsepower of each group to get the cost per horsepower hour.

Table 3.
Average Cost per Hour of Operating Tractors by Size Groups, 1939-1941

Size Group	Small	Medium	Large
Number tractors	29	45	18
Average horsepower per tractor	10.1	15.9	23.8
Operating costs			
Fuel	.133	.183	.270
Lubricants	.021	.021	.034
Labor	.012	.013	.022
Cash repairs	.020	.034	.061
Total	<u>.186</u>	<u>.251</u>	<u>.387</u>
Fixed charges			
Depreciation	.152	.167	.285
Interest @ 6% on average value	.075	.069	.117
	<u>.227</u>	<u>.236</u>	<u>.402</u>
Total cost per hour	.413	.487	.789
Adjusted cost per hour*	.378	.531	.699
Cost per horsepower hour	.041	.031	.033
Adjusted cost per horsepower hour*	.038	.033	.029
Hours of work per year	506	710	464
Labor and material per 100 hours			
Servicing, hours	4.2	4.3	5.1
Repairing, "	0.9	1.9	3.8
Fuel, gallons	112.0	167.0	253.0
Cylinder oil, gallons	2.9	3.1	4.3

* Adjusted for differences in hours of work per year. The total fixed charges for each group have been divided by 598 hours, the average hours of work per tractor for all tractors included in the study, in computing the adjusted cost per hour.

The adjusted cost per horsepower hour was 15% higher for the small tractors than for those of medium size and 12% lower for the large tractors. These figures would seem to suggest that the larger the tractor the less the cost per power unit. However, as will be pointed out in more detail under the discussion of rates of performance by tractors of different sizes, the accomplishment in terms of acres covered per horsepower was 14% higher for the small tractors than for those of medium size and 14% less for the large tractors. The larger the tractor the lower was the accomplishment per horsepower due largely to the fact that as tractors increased in size farmers did not use implements correspondingly large or increase the speed enough to offset smaller size of the machine. It would appear therefore that with similar load the cost per horsepower hour was fairly constant regardless of the size of the tractor.

Kind and Amount of Work Done by Tractors

The average hours of use per tractor in 1941 as well as the range are shown in Table 1 for each size group. The average for all groups was 663 hours. One farmer used a large tractor only 100 hours whereas another operated a medium size tractor 1506 hours. The distribution of work between belt and drawbar work and between home and custom work is shown for 1941 in both hours and percentages in Table 4. A similar distribution for all tractor work for the 3-year period is shown in Table 5. A larger proportion of the work in 1941 was drawbar work than in previous years. This was largely due to the change from binder-thresher harvesting to combine harvesting.

Table 4.
Distribution of Annual Hours of Work per Tractor, 1941

Tractor Size	Home Work			Custom Work			All Work		
	Drawbar	Belt	Total	Drawbar	Belt	Total	Drawbar	Belt	Total
					<u>Hours</u>				
Small	483	31	514	60	0	60	543	31	574
Medium	650	43	693	61	3	64	711	46	757
Large	454	24	478	31	-	31	485	24	509
Av. all	569	36	605	56	2	58	625	38	663
					<u>Percentages</u>				
Small	84.2	5.4	89.6	10.4	-	10.4	94.6	5.4	100.0
Medium	85.8	5.7	91.5	8.1	0.4	8.5	93.9	6.1	100.0
Large	89.2	4.7	93.9	6.1	-	6.1	95.3	4.7	100.0
Av. all	85.8	5.4	91.2	8.5	0.3	8.8	94.3	5.7	100.0

One of the advantages of tractor power over animal power is the fact that the tractor can be used very nearly continuously for 24 hours if necessary. However the farmers cooperating in this study seldom used their tractors more hours per day than is the common practice with horses. In fact, the average hours of tractor work per day was 5.8 in 1941 and 5.5 for the 3-year period. This information is given in Tables 6 and 7. Wet weather greatly delayed field operations in

the spring of 1941, and conditions were such that one would expect the farmer to speed up his work when the soil finally became fit to work. There is no evidence that he did this to any extent by working the tractor more hours per day. Only 3 farmers used their tractors as many as 15 hours per day at any time during the year. One used his tractor 17½ hours on one day, another used his 15 hours on one day, and a third used his 15 hours one day and 16 hours another. The long work days were during seedbed preparation and seeding in April and May. Since livestock have an important place in the organization of most of these farms, it is probable that livestock chores are an important factor limiting the farmer's time available for field work with the tractor.

Table 5.
Percentage Distribution of Annual Hours of Tractor Work, 1939-1941.

Tractor Group	Small	Medium	Large	All
Home work				
drawbar	82.7	84.9	74.1	82.1
belt	5.9	6.6	12.6	7.5
Total	88.6	91.5	86.7	89.6
Custom work				
drawbar	9.3	6.8	3.2	6.9
belt	2.1	1.7	10.1	3.5
Total	11.4	8.5	13.3	10.4
All work				
drawbar	92.0	91.7	77.3	89.0
belt	8.0	8.3	22.7	11.0
Total	100.0	100.0	100.0	100.0

The monthly distribution of tractor work classified into belt and drawbar operations and into home and custom work is shown in Table 8. The belt work is distributed throughout the year with approximately one half in August and September. This is largely threshing and silo filling. The drawbar work is distributed from April to November with corn ground preparation, corn cultivation, and small grain harvest during May, June, and July making up nearly half the total. Threshing and silo filling are the principal custom operations for belt power with harvest and corn picking contributing most of the custom drawbar work.

The specific types of operations for which tractors were used is shown in Table 9. Since there was no significant difference from year to year only the average for the 3 years is shown. More of the work of the large tractors is belt work than of the medium and small ones. The small tractors have insufficient power to operate effectively some of the belt driven machines such as threshing machines, silo fillers, and corn shredders. On the other hand tractor operators find it impractical to use sufficiently large machines for some drawbar operations such as harrowing, corn cultivation, mowing, binder harvest, or cutting corn to use large tractors economically.

Table 6.
Number of Days of Tractor Use and Hours of Tractor Work per Day, 1941.

Tractor Size Group	Hours per Day						Total days operated	Average hours per days
	Under 2 hr.	2-3 3/4 hr.	4-5 3/4	6-7 3/4	8-9 3/4	10 hr. and over		
Small	26	22	22	18	16	9	113	5.1
Medium	13	24	27	26	23	13	126	6.0
Large	15	21	22	16	15	7	96	5.3
Av. all	16	22	24	21	19	11	113	5.8

Percentage Distribution

Small	23	20	19	16	14	8
Medium	10	19	22	21	18	10
Large	16	22	22	17	16	7
Av. all	14	19	21	19	17	10

Table 7.
Number of Days of Tractor Use and Hours of Tractor Work per Day, 1939-1941.

Year	Under 2 hr.	2.0-3.9	4.0-5.9	6.0-7.9	8.0-9.9	10 hr. and over	Total days operated	Average hours per day
1939	16	24	21	20	16	11	108	5.4
1940	17	20	14	15	13	7	86	5.3
1941	16	22	24	21	19	11	113	5.8
3 yr. Av.	16	22	20	19	16	10	103	5.5

Percentage Distribution

1939	15	22	20	18	15	10
1940	21	23	16	17	15	8
1941	14	19	21	19	17	10
3 yr. Av.	16	21	19	18	16	10

Table 8.
Percentage Distribution of Tractor Hours by Months, 1940-41.

Month	Custom			Home			Total Work		
	Belt	Drawbar	Total	Belt	Drawbar	Total	Belt	Drawbar	Total
January	9.7	0.2	0.5	5.6	0.2	0.7	5.2	0.2	0.7
February	7.3	0.3	0.7	5.4	0.3	0.7	4.8	0.2	0.7
March	5.5	0.8	1.4	8.3	0.3	1.1	7.7	0.4	1.1
April	2.1	3.7	3.5	8.5	12.2	11.9	7.5	11.5	11.1
May	3.2	6.8	6.2	4.0	19.7	18.2	3.6	18.6	16.9
June	0.2	11.0	9.5	3.2	14.1	13.0	3.0	13.9	12.7
July	-	18.5	15.9	4.5	16.5	15.4	4.0	16.8	15.5
August	40.5	14.4	18.9	12.0	9.3	9.5	16.1	9.7	10.3
September	21.8	9.4	11.0	32.7	11.8	14.0	33.5	11.6	13.8
October	2.6	19.9	17.7	6.0	10.1	9.7	5.2	10.9	10.3
November	5.8	11.4	11.0	4.0	4.6	4.5	4.2	5.2	5.4
December	1.3	3.6	3.7	5.8	0.9	1.3	5.2	1.0	1.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9.
Percentage Distribution of Tractor Use by Size Groups, 1939-41.

	Tractor Size Groups			Average
	Small	Medium	Large	all
	%	%	%	Tractors
Plowing and preparing seedbed*	43.5	40.5	48.9	43.1
Seeding**	4.4	4.1	3.8	4.1
Cultivating row crops	14.6	15.0	4.6	12.8
Harvesting crops***	18.9	25.3	12.8	20.8
Miscellaneous	9.8	5.8	5.7	6.9
Total drawbar work	91.2	90.2	75.8	87.7
Threshing, silo filling and corn shredding	0.5	5.1	14.0	5.4
Grinding feed	2.2	3.5	4.8	3.3
Miscellaneous	6.1	1.2	5.4	3.6
Total belt work	8.8	9.8	24.2	12.3

* Includes, in addition to plowing, chiefly disking, springtooth harrowing, and field cultivating.

** Includes seeding of small grain and row crops.

*** Includes hay, grain, and corn harvest.

Rate of Tractor Performance

The average rate of accomplishment per hour by operations for each tractor size group is given in Table 10. Since the 1941 average so closely approximates the 3-year average, only the latter figures are shown. Since the average horsepower of the medium tractors is approximately 57% greater than that of the small tractors and that of the large tractors 50% greater than that of the medium, one might expect the rate of accomplishment to be in somewhat the same proportions.

Table 10.
Rate of Tractor Accomplishment per Hour for Specific Operations, 1939-1941.

Operation	Unit of Accomplishment	Tractor Size Group		
		Small	Medium	Large
Plowing	acre	.61	.85	1.21
Disking	"	2.52	3.82	5.29
Springtooth-harrowing	"	2.21	2.86	3.71
Field cultivating	"	1.89	3.02	3.48
Spiketooth harrowing	"	6.54	8.07	8.33
Seeding small grain	"	2.27	3.43	3.90
Planting corn	"	1.82	2.69	-
Cultivating corn	"	1.91	2.65	2.69
Mowing hay	"	1.47	2.50	2.97
Raking hay	"	2.26	2.40	2.94
Harvesting grain (binder)	"	1.82	2.12	2.14
Harvesting grain (combine)	"	1.02	1.31	2.13
Windrowing grain	"	-	2.64	3.68
Cutting corn	"	.85	.76	.83
Picking corn	"	.60	1.05	.96
Grinding feed	pound	1397	2161	2261
Threshing grain	bushel	-	80	137
Shelling corn	"	45	92	146
Filling silo	ton	-	5.1	10.7

Actually at most operations the rate of accomplishment per horsepower is slightly greater for the smaller tractors. This is shown in Table 11. Only drawbar operations are included since the drawbar horsepower ratings were used in making these computations. At no operation common to both groups was the accomplishment per horsepower of the large tractors equal to that of the small ones. The medium tractors equaled or exceeded the accomplishment of the small tractors at only 4 operations. The principal reason for this greater accomplishment of the smaller tractors is indicated in Table 12. The average width of implement used for each operation for each tractor size group as well as the average width per

drawbar horsepower is shown. In no case is the working width of machine per horsepower for the large tractors equal to that of the medium tractors. Only in case of corn picking is the working width of machine used with the medium tractors equal to or greater per horsepower than that for the small tractors. Apparently the operators of the larger tractors find it more difficult to keep them loaded to capacity than do the operators of the small tractors. In some cases they do it by using 2 types of machines at one time such as a plow and a harrow or a disk and a harrow. A Spiketooth harrow large enough to utilize the full power of a large tractor would be unwieldy. Many operations are of such limited importance that it is more economical to use the tractor at less than optimum efficiency than to invest in machines large enough to utilize its full capacity. To a certain extent the tractors drawing machines with a narrower cutting width are operated at somewhat greater speeds and thus the size of implement handicap is at least partially offset. As pointed out in the discussion of costs, the cost for unit of accomplishment is about the same for all sizes of tractors.

Table 11.
Rate of Tractor Accomplishment per Horsepower per Hour
For Specific Operations, 1939-1941.

	Unit of Accomplishment	Tractor Size Group		
		Small	Medium	Large
Plowing	Acre	.06	.05	.05
Disking	"	.25	.24	.22
Springtooth harrowing	"	.22	.18	.16
Field cultivating	"	.19	.19	.15
Spiketooth harrowing	"	.65	.51	.35
Seeding small grain	"	.22	.22	.16
Planting corn	"	.18	.17	-
Cultivating corn	"	.19	.17	.11
Mowing hay	"	.15	.16	.12
Raking hay	"	.22	.15	.12
Harvesting grain (binder)	"	.18	.13	.09
" " (combine)	"	.10	.08	.09
Windrowing grain	"	-	.17	.16
Cutting corn	"	.08	.05	.03
Picking corn	"	.06	.07	.04

The rate of accomplishment is fairly closely related to the size of implement used. In Table 13 are presented the average rates of performance for the more important operations for the different sizes of implements in common use. These data are a composite for all sizes of tractors. The average rate of performance per inch or foot of working width for all tractors has been multiplied by the number of feet or inches of working width for the usual standard sizes of machines. They should prove a useful guide in determining the saving of time or increase in accomplishment expected by using a large machine as compared with a smaller one.

.Table 12.
Average Working Width of Implement Used With Tractors of Each Size
Group and Average Working Width per Horsepower, 1939-1941.

Implement	No. Machines	Average Working Width			Working Width per horsepower		
		Small ft.	Medium ft.	Large ft.	Small in.	Medium in.	Large in.
Plow	90	2.0	2.7	3.7	2.4	2.1	1.9
Disk	81	9.9	13.0	17.1	11.8	9.8	8.6
Springtooth harrow	33	8.1	8.5	9.5	9.6	6.4	4.8
Field Cultivator	38	8.3	8.3	9.5	9.9	6.3	4.8
Spiketooth harrow	77	18.8	20.4	21.6	22.3	15.4	10.9
Grain drill	47	9.6	10.6	12.4	11.4	8.0	6.3
Corn planter*	15	7.4	11.0	-	8.7	8.3	-
Corn cultivator*	60	6.8	7.2	7.0	8.1	5.4	3.5
Mower	24	5.2	6.7	7.0	6.2	5.1	3.5
Grain binder	56	8.1	8.5	9.0	9.6	6.4	4.5
Combine harvester	11	5.5	7.0	8.8	6.5	5.3	4.4
Corn binder*	31	3.5	3.5	3.5	4.2	2.6	1.8
Corn picker*	30	3.5	5.7	4.7	4.2	4.3	2.4

* Width based on 3' 6" rows.

Table 13.
Average Acres Covered per Hour With Implements of Different Sizes, 1939-1941.

<u>Plowing</u>					
1-16" bottoms	.42 acres	2-15" bottoms	.73 acres	3-14" bottoms	1.10 acres
1-18" " "	.47 " "	2-16" " "	.84 " "	3-16" " "	1.25 " "
<u>Disking</u>					
7 ft.	2.16 acres	11 ft.	3.40 acres	15 ft.	4.64 acres
8 " "	2.48 " "	12 " "	3.71 " "	16 " "	4.95 " "
9 " "	2.78 " "	13 " "	4.02 " "	18 " "	5.57 " "
10 " "	3.09 " "	14 " "	4.33 " "	20 " "	6.19 " "
<u>Springtooth harrowing</u>					
7 ft.	2.23 acres	9 ft.	2.87 acres	11 ft.	3.46 acres
8 " "	2.55 " "	10 " "	3.20 " "	12 " "	3.84 " "
<u>Field cultivating</u>					
7 ft.	2.22 acres	8 ft.	2.54 acres	10 ft.	3.13 acres
7½ " "	2.38 " "	9 " "	2.81 " "	11 " "	3.44 " "
<u>Spiketooth harrowing</u>					
12 ft.	4.34 acres	18 ft.	6.52 acres	23 ft.	8.32 acres
15 " "	5.43 " "	20 " "	7.24 " "	25 " "	9.05 " "
16 " "	5.79 " "	22 " "	7.96 " "	26 " "	9.41 " "
<u>Seeding small grain</u>					
7 ft.	2.06 acres	10 ft.	2.95 acres	12 ft.	3.54 acres
8 " "	2.36 " "	11 " "	3.24 " "	14 " "	4.09 " "
<u>Planting corn</u>					
2-row	1.63 acres	3-row	2.45 acres	4-row	3.27 acres
<u>Cultivating corn</u>					
1-row	1.11 acres	2-row	2.22 acres	4-row	4.44 acres
		3- " "	3.33 " "		
<u>Mowing hay</u>					
4 ft.	1.47 acres	5 ft.	1.83 acres	7 ft.	2.60 acres
		6 " "	2.20 " "		
<u>Harvesting grain binder</u>					
6 ft.	1.37 acres	7 ft.	1.60 acres	10 ft.	2.29 acres
		8 " "	1.83 " "		
<u>Harvesting corn binder</u>					
		1-row	.81 acres		
<u>Picking corn</u>					
	1-row	.65 acres		2-row	1.30 acres