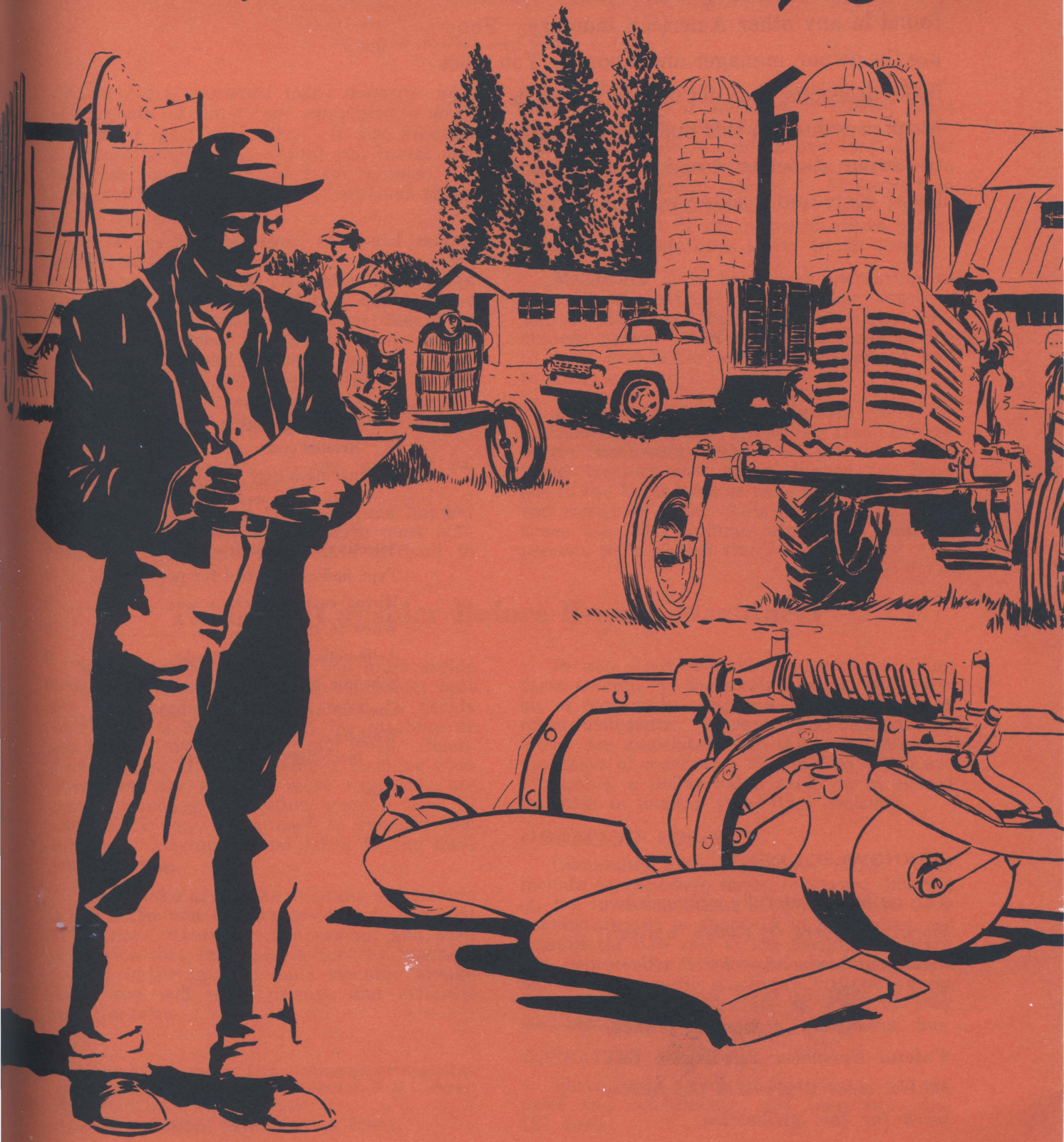
You can

Reduce Farm Machinery Costs



TEXAS AGRICULTURAL EXTENSION SERVICE
J. E. Hutchison, Director, College Station, Texas

WHAT THIS PUBLICATION IS ABOUT

Farming today is a business with a greater investment in equipment per worker than is found in any other American industry. You are the owner, manager and laborer. You must make decisions, then act on and live with them. Ideas presented in this publication can be used to arrive at better decisions with resulting lower costs and greater returns on machinery.

CONTENTS

ACKNOWLEDGMENT

The authors gratefully acknowledge work of Robert O. Gilden, agricultural engineer and John B. Claar, former chief of farm management and production economics branch, Federal Extension Service, on this subject since it provided the framework for this publication.

You Can . . .

Reduce Farm Machinery Costs

*Cecil A. Parker and Willie L. Ulich**

PROFITABLE FARMING today requires adequate machinery and equipment to make your labor most productive. It also requires a balance between the capital you invest and the labor you put into the farm business. It has never been more true that "you must spend money to make money."

It is possible, however, to spend money without adding to your income. At the same time many farmers can profitably spend more for machinery, especially if they can increase their volume of business and lower their costs per unit of product. The big questions are:

1. Which costs should I increase and which should I cut?

2. Which costs can I cut that will not cut my income?

3. Which machines, if any, are not essential to my farm business?

Choosing the right type, size and number of machines to operate your farm most efficiently is a difficult job. It is difficult to know when a farm is adequately equipped. Also, machinery is one of your biggest items of expense. A 1955 United States Department of Agriculture study shows that of total production costs machinery costs ranged from 15 percent on sheep ranches to 66 percent on grain and livestock farms in the Great Plains[1]. Thus, this part of the business offers one of your best opportunities to try to cut costs.

Machinery costs have been increasing as a result of continued specialization, substitution of machinery for labor and higher machinery prices. Part of this increase is due to more and better accessory equipment and to rising costs of it.

Along with this trend toward more investment in machinery, there is a trend toward bigger machinery. About 80 percent of the wheel tractors now being shipped for farm use in the United States have a 30 horsepower belt rating or more. This is more than three times the 1947 volume when less than 25 percent were of this size[1].

Things to Consider Before Buying Machinery

When buying machinery, you must decide which make, size and type of equipment best fits your needs. You also need to decide whether it is better to own the machine or buy its services through custom work. Sometimes it pays to delay buying a machine even though custom work is more expensive because the money may return more if used in some other way. You need to consider the balance of machinery and labor to the total job to be done.

Your choice of a make or brand of machine is like automobile ownership—largely personal preference. Remember the amount and kind of service that is available for the machine is very important. If your machine breaks down, you will want prompt and efficient repair service.

In any decision-making process involving farm machinery, the straight economic analysis of *ownership costs and operating costs* is often inadequate. There are also *related costs* which are associated with the ownership and operation of machines. While they often are intangible, a dollar value needs to be placed on them in making your final decision.

OWNERSHIP COSTS

Ownership costs are mostly fixed. They include depreciation, taxes, insurance, interest on the investment and housing. These costs usually amount to about 15 to 20 percent per year of the new cost of the machine. Except for depreciation, they are about the same whether you use the machine a little or a great deal. Machines depreciate by wear or they may become obsolete.

OPERATING COSTS

Three items belong in this class: (1) repairs and maintenance; (2) lubrication and (3) fuels.

*Respectively, extension farm management specialist and agricultural engineer, The Texas A. & M. College System.

[1]Farm Cost Situation, November 1956, USDA.

Repairs and Maintenance

This expense is usually low during the early life of a machine, and increases as the machine ages. Usually you can estimate your annual repair cost as a percentage of the new cost, Table 1. For example, with average maintenance, a tractor will require about 3.5 percent of its new cost each year in repairs. A $3,000 tractor then would have an average annual repair bill of $105. If you are above average in the maintenance of your tractor, your repair bill is less—if you are below average, it becomes larger.

The costs on your farm may differ from those shown in Table 1. You can adjust these values as needed by keeping simple records on costs of some of your major machines.

Lubrication

These costs include greases and oils used to operate and maintain your machinery, however, they are essential to good operation. The gallons of oil used in an engine in a year's time should be about three percent of the gallons of fuel consumed. Tractor transmissions require about one and one-half percent of the fuel consumed.

Fuels

Among these costs are gasoline, Liquid Petroleum Gas or diesel fuel used on your farm machinery. Farm engines perform, on the average, at about 85 percent of their rated horsepower. Tractors normally require about 0.10 gallon of gasoline, 0.13 gallon of LPG or 0.07 gallon of diesel fuel per horsepower hour of operation. To determine fuel requirements per hour for a given tractor, multiply the horsepower under which the tractor will operate by the appropriate consumption rate.

TABLE 1. SUGGESTED VALUES TO USE IN CALCULATING ANNUAL REPAIRS, MAINTENANCE AND LUBRICATION CHARGES.[1]

Machine	Percent first cost of machine for annual repairs
Baler, hay, with engine	3.8[2]
Binder	2.5
Combine, trailed, P.T.O.	4.0
Combine, self-propelled	3.4[2]
Combine, trailed, engine	3.5[2]
Corn picker	4.0
Cultivator	3.8
Cutter, ensilage	3.0
Disk, harrow	3.5
Field, forage chopper	4.5
Grain drill	2.2
Grinder, hammer	2.0
Harrow, spike tooth	1.1
Lister	5.5
Manure spreader	2.0
Mower	4.2
Planter, corn	2.5
Plow, moldboard	7.4
Plow, vertical disk	5.5
Sprayer, field	5.0
Rake, side delivery	2.5
Tractor	3.5[2]
Truck	5.0[2]

[1]F. C. Fenton and G. E. Fairbanks, **The Cost of Using Farm Machinery,** Kansas Engineering Experiment Station Bulletin 74, 1954.
[2]Engine and transmission oil not included.

RELATED COSTS

When selecting the type and size of machine, consider not only the *basic cost* of different machines but also *related costs.*

Costs of Associated Equipment

Some machines require more companion equipment than others. For example, in corn harvesting, the picker-sheller calls for more companion equipment than the cornpicker.

Diverse Use of Equipment

Some items of equipment may have many uses, while others may have but one. Consider this point when buying equipment. For example, you can use a pickup hay chopper and its companion equipment to put up silage as well as make hay, but a hay baler does only one job.

Time and Labor

You can replace labor with machinery. For example, it takes less time to plow a field with four-row equipment than with two-row. Whether to make this substitution depends on the amount of capital and labor that you have and the other uses you have for each.

If plowing comes at a critical time on your farm, you may prefer to substitute machinery for your time. Machinery cost may be related to the amount of drudgery and hard work you wish to avoid, or the leisure that you wish to buy. For example, you may select power steering for more convenient and easier work. Thus, you may base your decision of which machines to buy on more than costs and expected accomplishments.

Quantity and Quality of Crop Produced

The machinery you use may have an effect on the yields. For example, a self-propelled combine harvests as well when opening up a field as later. A pull-type combine, on the other hand, may harvest only 75 percent of the standing grain on the opening swaths because of shattering as the tractor runs through the grain. Some machines are better fitted to do the job than others and, therefore, harvest more of the crop.

Quality of crop produced is just as important as quantity in considering machinery.

For example, a hay rake that shakes off many of the leaves may cost less to own and operate than one that moves the hay gently across the swath, until you consider the additional leaves that are lost. Since most of the feed value of hay is in the leaves, it is important to save them. Therefore, you can afford to pay more for the rake that will give a higher quality product.

In other cases, certain sets of equipment will produce both quantity and quality. For example, a drying installation will help you to get the largest yield on a high-quality crop. You can harvest the crop at high moisture content, and thus cut the loss from shatter and risk of weather. Drying maintains quality.

Weather Risk

Machinery that lets you get the job done with minimum weather risk may pay for itself in a single season. This may mean getting to the job sooner, as with a corn-picker-sheller-drying operation, or getting the job done faster with a larger machine.

Because of these related costs, many farmers prefer to use the returns per dollar spent, rather than the amount of their costs, as a guide to the machinery they can own profitably.

Cutting Machinery Costs

You may be able to cut machinery costs by reducing ownership or operating costs. If you already are equipped and operating, your immediate cuts may come in shaving operating costs. However, in the long run, your biggest single saving may be made by saving on ownership costs.

CUTTING OWNERSHIP COSTS

Cutting ownership costs may require long-run planning. At any given time many of your costs are somewhat fixed, since frequently you cannot dispose of the machines at a practical price even though a change appears wise. Machines also form functional groups; if you change one machine, you often need to change others. Because of these complications, the opportunity to cut some of these costs, particularly machinery investment and depreciation, may occur only when you are considering a new investment. Thus, your choices of which machinery to own are important.

Ownership costs are a big part of the total costs of a machine. You can spread these fixed costs by using the machine more hours—through custom work or enlarging your farm. The number of hours a machine will be used is important in buying machinery. More time at work means lower ownership costs per acre or per hour of use.

Your decision to do custom work or expand farm size cannot rest solely on making effective use of machinery. The relative return from using labor and capital in these ways must be weighed along with lower machinery costs.

Other ways of cutting ownership costs are: (1) making wise choice of new machines, (2) knowing when to trade, (3) owning expensive machines jointly with neighbors and (4) trading the use of machines with low annual use with neighbors.

CUTTING OPERATING COSTS

Repairs and Maintenance

Texas' farmers in 1957 spent more than $74 million on farm machinery repair. The average repair bill for the tractor and other machinery amounted to $306 per farm per year.

You can cut machinery repair costs. 4-H Club members in the tractor maintenance project have cut repair costs substantially. Their records prove it. They have done this by keeping machinery in good adjustment, using it as it was designed to be used and carrying out preventive maintenance practices.

You receive an operator's manual with each machine you purchase. *USE IT.* It is your guide to low-cost, long-time operation.

Breakdowns during busy seasons can be costly. Do as much of your repair work as possible in off seasons. See that your machine is in top condition before using it. Then, by proper maintenance and use, you can minimize costly breakdowns.

One way to reduce repair costs is to do some or all of your repair work. First, consider the following costs and weigh them against possible savings: (1) the cost of acquiring skill and knowledge; (2) the cost of your time used to do the work and (3) the cost of the farm shop and equipment compared to the amount of work you have to do.

Lubrication

Your lubrication costs may rise when you follow a good preventive maintenance program, but you save these added costs many times

by lowering your repair bill. Be sure to store and use your lubricants in a safe, clean place. Dirty lubricants do more harm than good.

Fuels

In 1957 Texas farmers spent over $100 million for petroleum products for farm use or an average of $418 per farm. You can cut this cost in three ways:

(1) Engineers estimate that 10 percent of all petroleum fuel burned on the farm is wasted by faulty carburetor adjustment—an adjustment that you can make easily by following the operator's manual.

(2) Experts estimate that 75 percent of all farm machinery is operated out of proper adjustment. Naturally this boosts operating costs. You may have seen plowing demonstrations where a plow was out of adjustment and the tractor had to operate in second gear. When the plow was aligned properly, the tractor could pull it easily in third gear. This adjustment would amount to a substantial saving in fuel used per acre.

(3) Storage of fuel is important. University of Missouri tests show about a three percent fuel loss from a red, unshaded storage tank. When the tank was painted white, shaded and a pressure vent cap added, the evaporation loss was cut to a fraction of one percent. To cut evaporation losses the most and to maintain quality of the fuel, underground storage is desirable.

Selecting a Machine

Before selecting a machine, you should figure the annual cost of owning each of several kinds of machines. For example:

You have 180 acres of grain and want to know if you should buy a 6-foot pull-type combine or a 12-foot self-propelled one.

First, set up a table similar to Table 2 and work it through.

TABLE 2. ANNUAL OWNERSHIP AND OPERATION COSTS.

	12-foot self-propelled	6-foot pull type	Your Example
New Cost	$ 5,300	$ 1,900	
Ownership costs:			
Depreciation—new costs divided by 10 years[1]	477	171	
Interest—6% on ½ of new cost	159	57	
Taxes—½ to 1% of new cost; assume 1%	53	19	
Insurance—0.25% of new cost	13	5	
Shelter—0.75% of new cost	40	14	
Total ownership costs	$ 742	$ 266	
Operation costs:			
Repairs—self-propelled, 3.4% new cost —trailed, 3.5% new cost	180	67	
Fuel, oil and lubrication of combine; 1 gal. per acre on self-propelled	59		
¾ gal. per acre on pull type		40	
Fuel, oil and lubrication of tractor; about 1 gal. per acre		48	
Total operation costs	$ 239	$ 155	
Total ownership and operational costs	$ 981	$ 421	
Associated factors:			
Associated equipment[2]			
Tractor		120	
Grain truck	——	——	
Diversity of equipment[3]	——	——	
Convenience[4]		50	
Quantity of crop harvested[5]		50	
Quality of crop harvested[6]	——	——	
Time			
Labor—hours @ $1/hour[7]	50	90	
Additional value of labor saved over $1/hour	——	——	
Weather risk[8]	——	——	
How and where the product will be used[9]			
Total consideration—owning and using	$ 1,031	$ 731	

[1]A sale value of 10 percent of the original cost was assumed.

[2]The tractor is required in the pull-type combine, and the cost of ownership and repair is prorated. A grain truck is required with each machine; therefore, in comparing the two machines no charge is made.

[3]There is no diversity of equipment in this example.

[4]The operator estimated it was worth $50 a year for the added convenience of operating the self-propelled combine. This $50 could be taken off the self-propelled column, or, as in this case, added to the pull-type column.

[5]The self-propelled combine was estimated to harvest about $50 more grain because of opening the fields and taking a wider cut.

[6]No difference in quality.

[7]Under time, one has to consider not only the actual hours saved but the value of this labor. The labor may be used in other work or in an activity, such as a vacation, hunting or fishing trip. In some cases, as in this example, no value will be placed on labor or time saved.

[8]Weather risk was not considered in this example.

[9]How and where the product will be used has to be considered along with the machinery. Does the machinery really fit the needs of the farm? In this case there was no difference between the two machines.

In this example it was cheaper to harvest the 180 acres of grain by owning a 6-foot pull-type combine than by owning a 12-foot

self-propelled one. The situation on other farms might call for a different conclusion. If the 40 hours of time saved by doing the work with the self-propelled combine could be used to advantage, that machine would be the better method. When you consider only the ownership and operation costs, the comparison was more favorable to the smaller machine than when you consider the related costs.

This same analysis method can be used to decide whether it is cheaper to own a machine or hire custom work.

In computing the number of days it will take to do a field, here's a rule of thumb: *one-tenth the speed in miles per hour times the width of the machine in feet will equal the acres per hour you can cover with that machine.*

Type and Cost of Fuel for Power Units

Fuel cost is the largest item of the total cost of operating a power unit and represents the largest item on which savings may be made. A change from one type of fuel to another (a change from gasoline to LPG on same unit) will not necessarily result in a savings in fuel costs. Converting a presently owned gasoline tractor to LPG is not recommended unless the conversion assembly includes parts to change the compression ratio of the engine. A conversion assembly usually can be justified if the cost of LPG is 4.5 cents per gallon below the cost of gasoline and the tractor is used a minimum of 600 hours per year.

TABLE 3. ADVANTAGES AND DISADVANTAGES OF FUELS FOR FARM TRACTORS[1]

Fuel	Advantages	Disadvantages	In general
Gasoline	1. Convenient, easy starting, simple operation. 2. Widely used. Stable prices. 3. Easily serviced engines. 4. Lowest first cost of engine. 5. Good resale of used tractors.	1. Power loss and valve trouble often result from combustion chamber deposits. 2. Fire hazards in storage and handling. 3. Pilferage.	A good fuel for small tractors and diversified jobs. Highest fuel cost for the work accomplished.
Diesel fuel	1. Highest engine efficiency. 2. Best part load economy. 3. Low fire hazard in handling and storage of fuel. 4. Long engine life. 5. Good fuel distribution insured by injection system.	1. First cost of engine is high ($400 to $800 above gasoline). 2. High compression makes a 12-volt electrical system or special starting equipment necessary. 3. Many shops are not well equipped for repair of diesel engines. 4. Injectors may foul with excessive idling.	A good fuel for tractors operating 800 hours and more per year. Lowest fuel cost for work done. Extra care should be taken to insure cleanliness of fuel.
LP gas	1. Clean burning. Minimum engine deposits and oil contamination. 2. Long engine life. 3. Good part load economy. 4. Good fuel distribution—fuel vaporizes before entering the manifold. 5. Smooth engine performance aided by high octane rating.	1. High first cost of engine and accessories ($150-$400 above gasoline). 2. Converted engines often low in efficiency. Carburetors are difficult to adjust. 3. Least work per gallon of fuel. 4. Special storage tanks are needed. 5. Fire hazards in storage and handling. 6. Hard starting in cold weather.	LP gas has become a popular engine fuel in some areas. Tractors should be used at least 400-500 hr. per yr. to show any real saving over gasoline. Price of the fuel may vary greatly from one area to another, and may vary from season to season.

[1]Compiled by F. R. Jones, head, Department of Agricultural Engineering, The Texas A. & M. College System

In figuring the cost of fuels it must be remembered that the compression ratio (C.R.) of the engine determines the fuel that may be used. High-compression tractors cost more initially; however the operational fuel costs are lower. The following table gives official fuel consumption and cost per horsepower-hour for commonly used farm tractors.

TABLE 4. FUEL COSTS OF OPERATING COMMONLY USED TRACTORS

GASOLINE — 20 cents per gallon — 6.08 lb. per gallon — C. R. 6.0 to 1						
Load (HP)	Gallons per hr.	Fuel cost per hr.	Gal. per hp.-hr.	Fuel cost per hp.-hr.	Grease and oil per hp.-hr.	Total cost per hp. hr.
22.5	2.5	$ .50	.11	$ .022	$ .003	$ .025
32.5	3.0	$ .60	.09	$ .018	$ .003	$ .021
LP GAS — 10 cents per gallon — 4.17 lb. per gallon — C. R. 7.0 to 1						
Load (HP)	Gallons per hr.	Fuel cost per hr.	Gal. per hp.-hr.	Fuel cost per hp.-hr.	Grease and oil per hp.-hr.	Total cost per hp. hr.
22.5	3.2	$ .32	.14	$ .014	$ .003	$ .017
33.0	4.0	$ .40	.12	$ .012	$ .003	$ .015
DIESEL FUEL—12 cents per gallon—7.04 lb. per gallon—C. R. 16 to 1						
Load (HP)	Gallons per hr.	Fuel cost per hr.	Gal. per hp.-hr.	Fuel cost per hp.-hr.	Grease and oil per hp.-hr.	Total cost per hp. hr.
22.3	1.7	$ .20	.08	$ .010	$ .003	$ .013
32.7	2.1	$ .25	.06	$ .008	$ .003	$ .011

To calculate the cost of fuel and lubricant, take the cost per horsepower hour from the selected fuel section and horsepower range, and multiply by the horsepower the tractor will be operated under. For example, the fuel for a 20 horsepower gasoline tractor would cost $.025 x 20 or $.50 per hour.

Hiring Custom Work

Often it is cheaper to hire the work done by a custom operator. If so, you will have to answer "yes" to these three questions, as well as consider the price, before deciding fully on custom hiring:

(1) Is custom work available?

(2) Is it available when you need it?

(3) Are the operators dependable and efficient?

Advantages of custom hiring are:

(1) You can avoid the investment in expensive machinery and use this capital elsewhere in your farm business where it may yield a higher return.

(2) You may avoid the risk of obsolete machinery and machine damage by wind, fire, theft or accident.

(3) You can ease your labor problem if the custom operator furnishes the labor.

(4) You may get a faster, more efficient job because the custom operator usually is more skilled in maintaining and operating this machinery.

Example of custom work versus owning a machine to harvest 50 acres of silage crops follows:

TABLE 5. CUSTOM WORK VERSUS OWNING A MACHINE

Item	Value
New cost	$2,200.00
Ownership costs:	
Depreciation—new cost divided by 10 years	220.00
Interest—6 percent on ½ of new cost	6.60
Taxes—½ percent of new cost	11.00
Insurance—0.25 percent of new cost	5.50
Shelter—0.75 percent of new cost	16.50
Total Ownership costs	259.60
Operating costs:	
Gasoline—auxiliary engine	30.00
Oil and grease—auxiliary engine	5.00
Repairs—3 percent of new cost	66.00
Total operating costs	101.00
Total silage cutter costs	360.60
Tractor costs	50.00
Tractor driver	37.50
Total all costs	448.10
Cost of custom work	
50 acres @ $7 per acre	350.00
Saved by custom work	98.10

Other equipment needed to harvest the silage crop was assumed to be the same whether machine was owned or custom hired. You may consider purchasing a machine with the idea of doing custom work. This would lower the cost of harvesting your own crop. Other factors, such as alternative use of labor and capital, should be considered in making the decision of owning or hiring the machine.

When to Trade

No one can give "pat" answers to this problem, but here are some things to consider and a method of dealing with them.

Finding the best time to trade is difficult because it's hard to forecast what keeping the old machine will cost. What will your repair bills be? How many breakdowns will occur? How serious may these breakdowns be in terms of lost time or crops? What will the trading situation be next year? Yet, you must make some decision about these questions.

The risk of breakdown and the repair cost on a year-old machine would not be as high as the depreciation on a new machine. At the other extreme, with a 15-year-old tractor, these risks and impending costs may be so high that buying a new machine is a fairly easy decision. Between these two extremes lies a wide range of situations which bear on your decision. Sometimes the pleasure of having a new machine is the basis for decision; sometimes the level of farm income is the deciding factor.

Usually, in deciding to trade, the economics of the situation is a starting point. To arrive at this, you have to place some rough evaluation on the costs of keeping the old machine compared with trading for a new one. Three kinds of consideration can be outlined. They are: (1) relative costs of ownership of the two machines; (2) relative costs of repairs and operation; and (3) the associated costs and consideration that go along with owning and using a given machine.

Indirect cost must be considered along with the decision of when to trade. Older or poorly maintained machines may cause a greater risk of breakdown. This can be viewed as a cost of keeping the old machine. In deciding what machinery to buy, you must assess this cost in light of your particular situation. *The costs and values placed on each of these will differ on each farm.*

Arithmetic of When to Trade

Consider Tom Smith who has a two-row tractor 5 years old. He is considering whether to trade for a four-row diesel tractor. The best trade-in allowance he can find is $500. At five percent interest this would mean the old tractor would cost him $25 a year interest on his investment. He figures that the tractor will be worth $100 less next year if he waits to trade. He could put the old tractor in shape for next year for $300. Thus, his total cost would be $425.

The new tractor that he is considering would cost $3,000. At five percent, the interest on this would amount to $150 next year. He estimates that the first year depreciation will be $600. The basic cost so far would be $425 on the old machine and $750 on the new, or $325 in favor of keeping the old machine.

But the new machine is more efficient in two ways. It takes less of Tom's time to perform field work and it operates more cheaply. He estimates that the value of time saved, savings on operation costs and increased timeliness of performing some jobs are easily worth $200 per year. The pleasure of owning and working with a new machine, together with the increased dependability, is worth $150. This $350 is plus value or gain. The new machine also contains several conveniences, such as power steering and lights. It is difficult to evaluate the pleasure of a new machine or conveniences that make work easier. In this case he would trade. Tabulated it looks like this:

Old Tractor	
Value $500 @ 5% interest	$ −25
Reduced trade-in value next year	−100
Repair to put it in shape	−300
Total cost of old tractor	$−425
New Tractor	
Value $3,000 @ 5%	$−150
Reduced trade-in next year	−600
Total cost of new tractor	−750
Efficiency	+$200
Less risk of breakdown[1]	+100
Pleasure of ownership and convenience of work	+ 50
Total value of associated factors	+350
Net cost of trading for a new tractor	$−400

[1]The value of this smaller risk is estimated like an insurance premium. A serious breakdown, if it occurs, might cost $300, but the chances of its occurring next year **because the old tractor is used** are estimated at only one in three. Hence $100 is credited to the new tractor.

Schedule Machinery Expenditures

Financing new farm machinery is easier if you spread your purchase over a period of years. This means planning ahead for important expenditures. Which ones must be made this year? What items can wait a year or two? How does each expenditure fit into your business and family goals?

Your machinery plan should be flexible. Your income may be larger or smaller than you expected. Also, emergencies involving heavy expense may arise. In some years you may be able to get "special buys." *Don't wait until the last minute on a must item.*

In years when you buy no replacements, don't be misled into thinking you had no machinery costs. Your machinery depreciates in value each year.

You may use a worksheet such at the one on page 11 to analyze your farm machinery needs. This worksheet will help you decide in advance what machines should be bought or replaced and the best time to do so. Form the habit of making this analysis once a year, preferably at income tax reporting time.

Cost-cutting Tips

Modern farming demands that a farm be well equipped. Money wisely spent on machinery is a good investment. But since machinery costs are major items of expense, it is possible to increase net income materially by making investments only after adequate study and with proper maintenance of machinery.

Check list:

1. Choose the best size and type of machine for the job.
2. Figure the costs of owning and using different sizes and types of machinery.
3. Compare the quantity and quality of work with prices of alternative machines.
4. Reduce your investment by joint ownership of some machines.
5. Meet your needs sometimes with second-hand machinery.
6. Help solve your problem through custom work or custom hiring.
7. Figure through the economics of a trade before you make it.
8. Shop around for the best buy.
9. Lower your repair bill through proper maintenance.
10. Extend useful life through preventive maintenance and timely repair.
11. Lubricate adequately and regularly.
12. Check to see if you can take advantage of quantity discounts.
13. Get repair work done in off seasons.
14. Keep the machine adjusted.
15. Follow the operator's manual.

Be Safe--Money Can't Buy Life or Limbs

WORKSHEET FOR SCHEDULING MACHINERY EXPENDITURES

Type of machinery	Date acquired	Cost	Remaining years of use	Replacement		Probable trade-in value	Cash or credit needed[3]
				years[1]	cost[2]		

[1]Put down the year you expect to replace each machine. Consider the physical condition of each, probable repair costs, your need for dependability and efficiency and how soon you might get an improved model.

[2]Estimate the probable cost of each new machine. You may use current prices even though the price may change by the time you buy it.

[3]Enter the difference between cost column and trade-in value.

Your County

EXTENSION AGENTS

can furnish you the latest information on farming, ranching and homemaking. They represent both The Texas A. & M. College System and the United States Department of Agriculture in your county.

Most county extension agents have their offices in the county courthouse or agriculture building. They welcome your visits, calls or letters for assistance.

This publication is one of many prepared by the Texas Agricultural Extension Service to present up-to-date, authoritative information, based on results of research. Extension publications are available from your local agents or from the Agricultural Information Office, College Station, Texas.

Cooperative Extension Work in Agriculture and Home Economics, The Texas A. & M. College System and the United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8, 1914, as amended, and June 30, 1914.
5M—1-59