



Managing Equipment

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Machinery Investment

- ⌘ Growing area on dairy farms.
- ☑ Equipment costs more
- ☑ Larger equipment being utilized
- ⌘ DFBS – Investment per Cow - 2011
 - ☑ Average = \$1,614
 - ☑ Range = \$662 – \$4,002
 - ☑ 16% of the total investment on the farm



Machinery Expenses

ACCUAL MACHINERY EXPENSES 184 New York Dairy Farms That Grow Forages, 2011

Machinery Expense Item	Average 184 Farms		Average Top 10% Farms ^a	
	Total Expenses	Per Tillable Acre	Total Expenses	Per Tillable Acre
Fuel, oil & grease	\$ 117,486	\$105.30	\$175,065	\$107.45
Machinery repairs & vehicle expense	128,451	115.13	178,230	109.39
Machine hire, rent & lease	53,562	48.01	72,706	44.62
Interest (5%)	43,734	39.20	61,178	37.55
Depreciation	112,311	100.66	154,092	94.57
Total	\$455,544	\$408.30	\$641,271	\$393.58
% of Total Farm Expenses	16.7%		15.7%	

^aAverage of farms with highest rates of return to all capital (without appreciation) that grow forages.



Machinery Investment

- ⌘ Necessary to perform tasks
- ⌘ Supports the production of products
- ⌘ Maintenance required
- ⌘ Breakdowns occur
- ⌘ Obsolesce occurs
- ⌘ Usually have some salvage value
- ⌘ Science and art



Machinery Investment

- ⌘ Purchase a machine only when it will reduce total production costs and/or increase income by an amount greater than the “added costs” of the new machine.
- ⌘ Machinery is a poor investment unless it can be used to efficiently produce a marketable product or perform a needed support service



Managing Machinery

- ⌘ Operations
- ⌘ Tracking Information
- ⌘ Preventative Maintenance
- ⌘ Breakdowns
- ⌘ Repair vs replace
- ⌘ Life's vs Reinvest'rs



Operations

- ⌘ What is the machinery doing?
- ⌘ Is it sized properly?
- ⌘ Is it set up properly?
- ⌘ Training of operators
 - ☑ Initial training
 - ☑ Continuous training
 - ☑ Monitoring of performance



Monitoring Operator Performance

- ⌘ Are they doing the right thing all the time?
- ⌘ How do you know?

Tracking Information

- ⌘ What should be tracked?
- ⌘ How can records be kept?
- ⌘ How can the information be used?

Trucks Harvesting Haylage, Cost per Operating Hour

	Truck 1	Truck 2	Truck 3
Operating Costs			
Labor	\$16.11	\$16.44	\$17.39
Fuel	\$12.30	\$9.49	\$11.49
Repair	\$5.40	\$5.51	\$5.25
Total Operating Costs	\$33.80	\$31.44	\$34.13
Ownership Costs			
Depreciation	\$4.56	\$4.90	\$2.10
Interest	\$3.91	\$4.13	\$1.97
Insurance	\$0.29	\$0.37	\$0.35
Total Ownership Cost:	\$8.76	\$9.40	\$4.41
Total All Costs	\$42.56	\$40.84	\$38.55

Preventative Maintenance

- ⌘ What needs to be done?
- ⌘ When does it need to be done?
- ⌘ Is it being done on time?
- ⌘ Is it being done right?

Breakdowns

- ⌘ Unavoidable
- ⌘ How do we minimize?
- ⌘ Why did they occur?
 - Operator error
 - Poor preventative maintenance
 - Wore out
- ⌘ Management implications?



Repair vs Replace

- ⌘ When a piece of equipment requires significant repairs, need to ask the question: "Do I repair or replace"?
- ⌘ Need to predict the future
- ⌘ Need to research replacement options
- ⌘ Look at a period of time
- ⌘ Discounted cash flow analysis



Discounted Cash Flow

- ⌘ Based on time value of money
- ⌘ A dollar in hand today is worth more than a dollar in hand in the future
- ⌘ What would you rather have?
 - ☑ \$10 today
 - ☑ \$10 1 year from now
- ⌘ Why?



Discounted Cash Flow

- ⌘ Why dollar in hand is worth more than dollar in the future
 - ☑ Risk - will you get paid it?
 - ☑ Use - if you have it you can use it
 - ☑ Inflation - less purchasing power in the future



Repair vs Replace

- ⌘ To be economically sound
 - ☑ Compare the net present values of repairing vs replacing piece of equipment
 - ☑ If the net present value is positive, than want to replace
 - ☑ If negative, want to repair equipment



Repair vs Replace Program

- ⌘ Excell template
- ⌘ Perform calculations
 - ☑ Net present value after tax
- ⌘ Need repair costs, loan rates, tax information, period to be analyzed, weighted cost of capital, changes in operating costs



Example

- ⌘ Loader, 12 years old, requires tires, potential additional repairs in future.
- ⌘ Local dealer wants to sell new loader
- ⌘ Larger capacity
- ⌘ Cost = \$155,000
 - ☑ Trade value of existing loader = \$40,000



Example continued

- ⌘ Cost of new tires = \$8,000
- ⌘ Additional repairs = \$3,300 a year for 3 years
- ⌘ Labor costs = \$11.96 per hour
- ⌘ Fuel costs = \$3.30 per gallon
- ⌘ Length of analysis = 10 years

Repair vs Replace



Salvage Value

- ⌘ What value does the machine have at the end of the period?
- ⌘ What is the difference in value between the two options?
- ⌘ Usually stated as market value - what could it be sold for or traded for in the future?
- ⌘ What value does that machinery have within your business?
- ⌘ Important variable in the decision making.

Repair vs Replace



Timeliness

- ⌘ What value does timeliness have?
- ⌘ Down time, speed of getting job done, increased labor efficiency?
- ⌘ Hard to measure but does have a value
- ⌘ Is the difference small enough that you feel that timeliness can make up the difference?

Repair vs Replace



Future Plans

- ⌘ What is the machinery requirement going to be in 1-3 years?
- ⌘ Will greater capacity be needed?
- ⌘ Will timeliness become more important?
- ⌘ Should you still be investing in this machinery?



Economic Decision

- ⌘ Support family mission/vision?
- ⌘ Does it make a profit?
- ⌘ How is it going to be paid for?
- ⌘ Is it best use of limited resources?



Management Implications

- ⌘ Two types of machinery
 - ☑ Life's
 - ☑ Reinvest's



Life's

- ⌘ Keep it forever
- ⌘ Will continually repair
- ⌘ Performs needed - but not day to day critical - operations around farm
- ⌘ Something else can usually fill in if breaks down - or not critical if task doesn't get done for short periods of time
- ⌘ Lots of pieces of equipment - but not lots of market value



Life's

- ⌘ Examples - although every farm different
 - ☑ Tractor that runs manure pump, bedding spreader
 - ☑ bedding spreader
 - ☑ Plow
 - ☑ Fertilizer spreader
 - ☑ Dump wagon that is only used during mud
 - ☑ Museum piece for the farm



Reinvest's

- ⌘ Will plan on replacing, updating at some point - will not keep forever.
- ⌘ Perform tasks that if disrupted will have immediate impact on earnings
- ⌘ Number of hours of use may make a piece of equipment a reinvest's
- ⌘ Timeliness a major factor



Reinvest's

- ⌘ Examples - again every farm different
 - ☑ Mixer wagon
 - ☑ Chopper
 - ☑ Hay mower
 - ☑ Primary tillage tractor
 - ☑ Skidsteer if only loader on farm
 - ☑ Mom's car?



Life's & Reinvest's

- ⌘ What about your farm?
- ⌘ Can you identify some in both?
- ⌘ When do things need to be replaced?
- ⌘ Repaired?
- ⌘ What will the future requirements be?
- ⌘ What other options do I have?



Repair vs Replace

- ⌘ Science
 - ☑ What has the lowest net present value?
- ⌘ Art
 - ☑ What value for timeliness?
 - ☑ What value at the end of useful life?
 - ☑ What about future needs?
 - ☑ How important is the task being performed?



Summary

- ⌘ Apply economic tools when faced with a repair vs replace decision
- ⌘ Understand the factors that influence the outcomes
- ⌘ Don't just make the decision that is easy or takes the least amount of time



Summary

- ⌘ Remember this quote:
When asked how much machinery is required on a farm, George Warren, former Cornell economics professor replied "As little as possible"



References

⌘ <http://www.ansci.cornell.edu/prodairy/resources/decisiontools.html>

☑ Repair vs Replace spreadsheet

⌘ <http://faculty.apec.umn.edu/wlazarus/tools.html>

☑ Various decision tools associated with machinery costs and decisions



QUESTION'S?