

Machinery Ownership and Leasing

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MAST Program
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Purpose of module

- Develop an understanding of the costs associated with owning and operating machinery
- Trying to reduce decisions to numbers
 - Custom hire
 - Own vs. rent
 - Lease vs. purchase
 - Trading strategies
- ... targeting the decision tools:
 - *OwnBaler.xls*
 - *OwnCombine.xls*
 - *OwnSprayer.xls*
 - *OwnTractor.xls*
 - *KSU-MachCost.xls*
 - *KSU-GPSguidance.xls*

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Module: Machinery Ownership and Leasing

Session: Machinery market valuation

Recorded fall of 2008

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This session:

- **Conceptual framework for calculating machinery costs related to decisions of**
 - Own vs. rent
 - New vs. used
 - Trading frequency
 - Financing
- **Machinery valuation**
 - Tax-based valuation (tax depreciation)
 - Market valuation (market depreciation)
- **Brief word on repairs**

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- **Machinery ownership decisions especially depend on**
 - **Time value of money issues**
 - Interest rates
 - Income tax rates
 - **Market value of machines over time**
 - **Market value of machines over usage rates**
 - **Repairs**
 - Because older machines have greater repairs and farmers trade off repairs and depreciation according to their perceived comparative advantage

A very big issue is MARKET VALUE and DEPRECIATION

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- **Tax depreciation method is selected to maximize long-run profits. As such, the machinery valuation method that results is only an accident or residual of profit seeking.**
- **Market value method is selected to meet a goal of market value accuracy, subject to being:**
 - useful for projections into the future
 - useful for comparisons across farms/clients
 - sufficiently low-cost to be practical
 - only as complicated as the task demands

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Machinery Market Valuation Methods

- Pure Market Methods
 - formal appraisal (independently verified)
 - informal appraisal (honor system)
- Formula Methods Based on:
 - Market purchase price (value if no trade)
 - List price for new equivalent
 - Trade difference (boot)

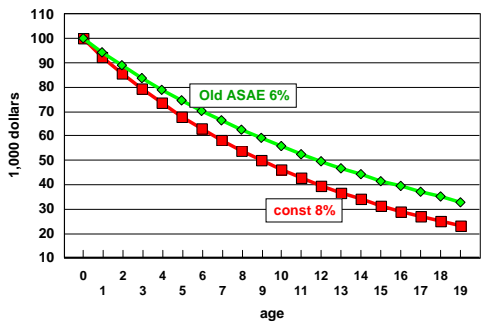
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Machinery Market Valuation Methods

- Constant % depreciation for all tractors or all machinery, for example 8% per year
 - Simple: for this year's value take last year's value times 0.92 (annual depreciation is 8%)
 - For tracking all equipment at bank (use 8%-9%)
 - There has been a precedent in the OLD ASAE
 - Tractors 6%
 - Combines 7%
 - Windrowers 10%
 - Silage cutters 10%
 - Balers 8%
 - Planters and tillage 4%
 - Drawback is that it doesn't account for usage rate

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Valuation of \$100,000 tractor over time using mkt methods



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Machinery Market Valuation Methods

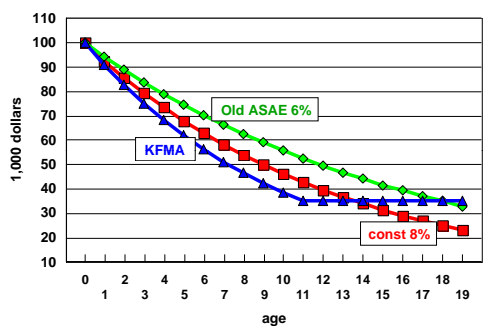
- **KFMA** – tax-like depreciation with salvage value, e.g., 100% DB at 10% per year until a salvage value of 35% is reached
 - Boot paid added to previous machine's value to become the initial value for the newly acquired machine
 - Only need to know boot, not "new price"
 - Mechanistic & fieldmen like "tax-like" framework

KFMA market depreciation parameters:

	Salvage	Time	Method
Pickups, autos	35%	5 yr	100%DB (20%)
Tractors, combines, and balers	35%	10 yr	100%DB (10%)
Planting, cultivate	20%	5 yr	150%DB (27.5%)
Tillage	20%	15 yr	150%DB (10%)
Other	20%	10 yr	150%DB (15%)

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Valuation of \$100,000 tractor over time using mkt methods



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Machinery Market Valuation Methods

- **ASAE** – attempt to improve Old ASAE by allowing value and depreciation to vary with usage rate
 - Calculated against LIST price of new equivalent
 - $RVP_{age} = 100[C_1 - C_2(\text{age}^{0.5}) - C_3(\text{avg hrs per yr})^{0.5}]^2$
 - Can find info on ASAE's website (at least in 2006)
 - ASAE still "allows" Old ASAE constant depreciation

Example ASAE market depreciation parameters:

	C_1	C_2	C_3
Small tractors (80hp)	0.981	0.093	0.0058
Med. tractors (80-150hp)	0.942	0.100	0.0008
Large tractors (150hp)	0.976	0.119	0.0019
Combines	1.132	0.165	0.0079
Balers	0.852	0.101	
Swathers	0.791	0.091	
Planters	0.883	0.078	

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Predicting REPAIRS

- Future repair costs over the life of a machine are very difficult to predict
- We use ASAE's formula:
 - Accumulated repairs = new equivalent price * RF1 * (hours on tractor / 1000)^{RF2}
 - RF1 and RF2 are factors from the ASAE
 - Annual repairs is the difference in accumulated repairs

Example ASAE repair factors:

	RF1	RF2
2wd tractors	0.007	2.0
4wd tractors	0.003	2.0
Combines	0.04	2.1

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End of Session:

Machinery market valuation

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