

# ABCs of Farming

Activity Based Costing

What Is It? - Activity based approach to tracking cost of production

- Examples**
- Crop Operation:**
    - Pre-plant ground preparation
    - Seeding/Fertilization
    - Pest Control
    - Harvest
    - Post Harvest Land
  - Hog Operation:**
    - Breeding
    - Farrowing
    - Weaner
    - Finishing
  - Hay Harvesting**
    - Swathing
    - Raking
    - Turning
    - Baling
    - Hauling & Stacking
    - Tarping
  - Silage Harvest**
    - Chopping
    - Hauling
    - Silage pit receiving
    - Tarping

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## Uses of ABC Information

- Identifies costs of each activity
- Enables comparisons
  - Industry or competitor costs
  - Custom rates
- Helps optimize decision to:
  - In-source, or
  - Out-source
- Basis for pricing
  - hiring or providing custom services

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## Costs/Acre\* - Conventional Seeding - Spring Peas

<u>Operation</u>	<u>Cost/Acre</u>
Fall Plow	\$18.00
Spring Harrow	3.50
Spring Cultivate	5.00
Cultivate/Incorporate Chemical	6.50
2nd Incorporation-Cultivator	5.00
Seed-Conventional Drill	15.00
Harrow	3.50
Roller/Packer	<u>3.00</u>
<b>Total Costs Per Acre</b>	<b>\$59.50</b>

Costs derived from activity based accounting/industry standard rates

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## Costs/Acre\* - Direct Seeded Spring Peas

<u>Operation</u>	<u>Cost/Acre</u>
Fall Heavy Harrow	\$4.00
Fall Roundup-Green Bridge	7.00
Custom Hire-Direct Seed Drill	17.00
Harrow	3.00
Roller/Packer	<u>3.00</u>
<b>Total Costs Per Acre</b>	<b>\$35.50</b>

Savings/Ac = \$24

*Other Qualitative Factors: less water loss, less compaction, less erosion risk*

Costs derived from industry standard rates

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## Separating Specific Activities for Cost Analysis

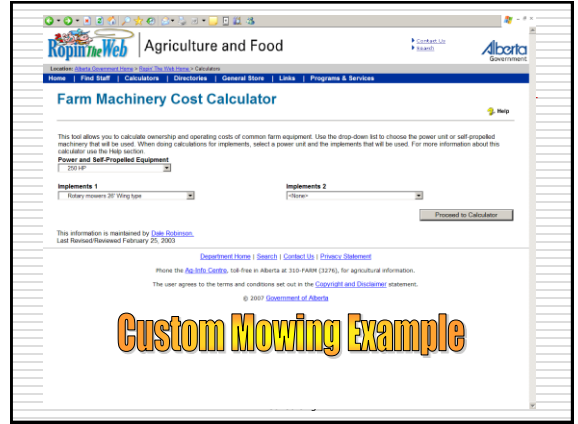
- No-Tillers**
  - Mowing
  - Spraying
  - NoTill seeding
- Hay Harvest**
  - Swathing
  - Raking/turning
  - Baling
  - Hauling, Tarping
- Silage Harvest**
  - Chopping
  - Hauling
  - Pit receiving/packing
  - Tarping
- Grain Harvest**
  - Combine
  - Trucking
  - Grain Wagon
  - Support Crews

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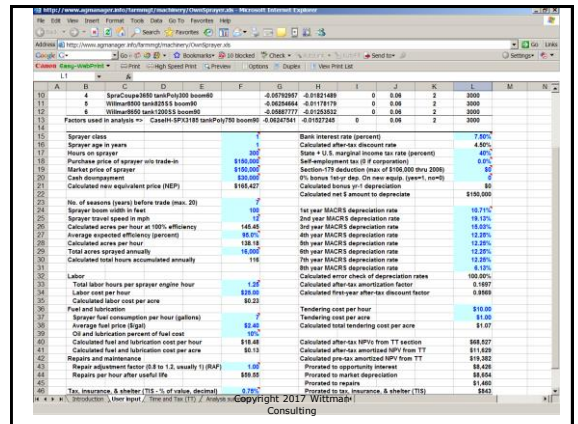
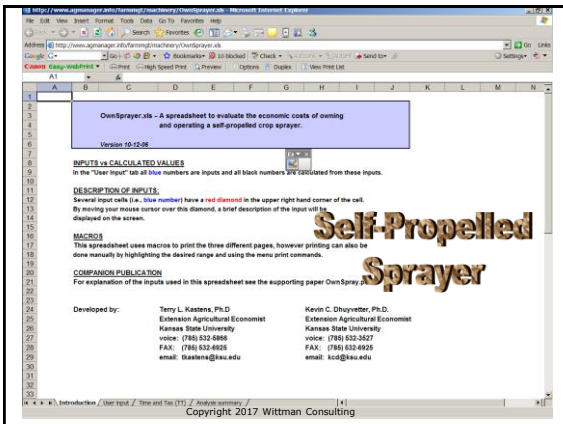
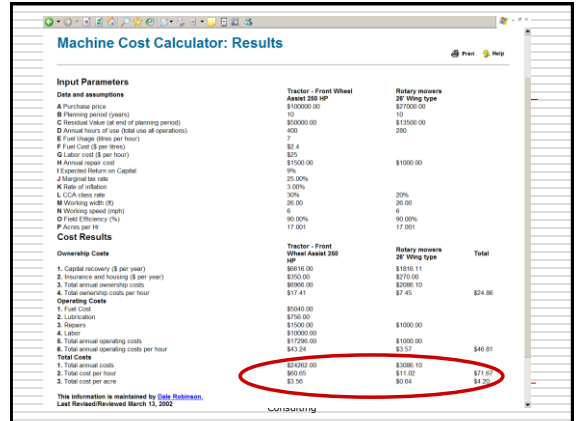
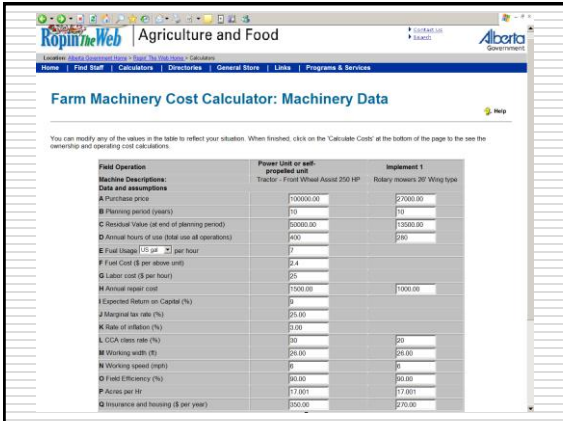
# Information Needed for Analysis

- Ownership costs
  - Cost of power unit/Implement
  - Planning Horizon/useful life
  - Salvage value
  - Cost of capital or borrowing
  - Insurance & housing costs
  - Tax rates
  - WARNING:** Use **YOUR** costs
  - NOT economic costs from someone else's data
  - NOT replacement cost
  - Annual usage of power unit – all operations
- Operating costs
  - Fuel
    - Consumption/hour
    - Cost of fuel
  - Labor cost
    - Primary operators
    - Support personnel
    - Repairs and Maintenance
    - Other Equip Support
    - Overhead Costs
  - Productivity of Operation
    - Working width
    - Speed
    - Field efficiency %

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## Custom Mowing Example



after-tax net present value of costs (NPVc) = **\$88,927**

after-tax NPV = **\$1,212** **\$5,966**

7.65%

opp.	market	deprec.	and tax	of sale	loan	discount	accru.	annual	repairs	tax	net	discounted
11	\$0	\$0	10.11%	\$16,085	\$13,035	\$0	\$0	\$0	\$0	\$0	\$6,426	\$2,874
12	\$10,200	\$10,800	10.12%	\$29,895	\$19,240	\$9,000	\$0	\$1,120	\$1,716	\$623	\$0,840	\$4,909
13	\$10,200	\$10,800	10.03%	\$22,245	\$82,895	\$9,000	\$0	\$1,538	\$2,808	\$1,099	\$0,007	\$13,489
14	\$9,300	\$9,840	12.28%	\$19,375	\$44,940	\$9,000	\$0	\$988	\$4,340	\$1,348	\$0,68	\$11,871
15	\$8,340	\$9,285	12.28%	\$18,375	\$44,940	\$9,000	\$0	\$888	\$5,781	\$1,821	\$0,10	\$11,982
16	\$8,760	\$9,300	12.28%	\$19,375	\$27,075	\$9,000	\$0	\$916	\$7,668	\$1,897	\$0,12	\$12,021
17	\$7,800	\$7,728	12.28%	\$18,375	\$9,180	\$9,000	\$0	\$784	\$9,821	\$2,193	\$0,13	\$12,113
18	\$8,900	\$7,740	12.28%	\$4,900	\$4,900	\$9,000	\$120,000	\$89,269	\$13,241	\$2,420	\$0,15	\$23,739

**2007 Purchase**

	\$/acre	\$/hour	\$/acre
Opportunity interest	\$8,428	\$72.77	\$0.93
Market depreciation	\$9,884	\$74.74	\$0.84
Repair and maintenance	\$1,465	\$12.61	\$0.09
Labor	\$2,818	\$21.28	\$0.23
Fuel and lubrication	\$2,145	\$18.48	\$0.18
Tax, insurance, & shelter (TIS)	\$843	\$7.28	\$0.08
<b>Total for sprayer only</b>	<b>\$26,140</b>	<b>\$217.12</b>	<b>\$1.97</b>
Tendering cost	\$17,158	\$148.18	\$1.07
<b>Total for sprayer and tendering</b>	<b>\$43,298</b>	<b>\$365.30</b>	<b>\$3.04</b>

**\$2.64/Acre**

**2017 Purchase**

	\$/year	\$/hour	\$/acre
Opportunity interest	\$8,952	\$39.06	\$0.45
Market depreciation	\$15,619	\$68.16	\$0.78
Repair and maintenance	\$9,959	\$35.53	\$0.45
Labor	\$7,161	\$31.25	\$0.36
Fuel and lubrication	\$5,672	\$24.75	\$0.28
Tax, insurance, & shelter (TIS)	\$1,679	\$7.32	\$0.08
<b>Total for sprayer only</b>	<b>\$48,142</b>	<b>\$210.08</b>	<b>\$2.41</b>
Tendering cost	\$29,729	\$129.73	\$1.49
<b>Total for sprayer and tendering</b>	<b>\$77,872</b>	<b>\$339.80</b>	<b>\$3.89</b>

**47%**

Date of analysis ===== 2/19/17  
 16,000ac → \$4.03/ac  
 25,000ac → \$3.83/ac

Let's examine a baler purchase analysis...using Ag Manager

**\$8.95/T owned vs. \$18.00/t hired**  
**\$9/t x 2500T = \$22,500**

	\$/year	\$/bale	\$/ton	\$/hour	\$/acre
Opportunity interest	\$8,764	\$7.44	\$2.31	\$100.28	\$4.61
Market depreciation	\$2,884	\$9.87	\$1.86	\$71.07	\$3.15
Repair and maintenance	\$267	\$9.07	\$0.11	\$4.89	\$0.21
Tax, insurance, & shelter (TIS)	\$783	\$9.19	\$0.31	\$14.00	\$0.61
<b>SUBTOTAL*</b>	<b>\$10,698</b>	<b>\$24.67</b>	<b>\$4.39</b>	<b>\$191.38</b>	<b>\$8.58</b>
Tire/tye or net wrap	\$2,915	\$9.88	\$1.41	\$64.26	\$2.81
Traction rental charge	\$3,829	\$9.96	\$1.63	\$79.80	\$3.08
Labor	\$2,441	\$9.81	\$0.98	\$44.43	\$1.98
Fuel and lubrication	\$1,850	\$5.47	\$0.75	\$24.45	\$1.02
<b>SUBTOTAL</b>	<b>\$11,884</b>	<b>\$23.92</b>	<b>\$4.67</b>	<b>\$213.54</b>	<b>\$9.38</b>
<b>Total for balling operation*</b>	<b>\$22,389</b>	<b>\$5.66</b>	<b>\$8.06</b>	<b>\$408.92</b>	<b>\$17.90</b>

Equipment & Land Decisions  
[www.agmanager.info/tools/default.asp#LAND](http://www.agmanager.info/tools/default.asp#LAND)

MACHINERY and BUILDING DECISION TOOLS					
Custom Rate Projections for 2014	Download	Download	PDF		
OwnBaler	Kastens and Chappetter	Download	PDF		
OwnCombine	Kastens and Chappetter	Download	PDF		
OwnTractor	Kastens and Chappetter	Download	PDF		
OwnSprayer	Chappetter, Urseth, and Kastens	Download	PDF		
Guidance & Section Control Profit Calculator	Chappetter, et al	Download	Dashboard	View	WMV (Dashboard) or Video (Excel)
RSU GPS Guidance	Kastens, Chappetter, and Kastens	Download	PDF		
RSU Truck Cost	Chappetter	Download	PDF		
RSU MachCost	Beaton, Chappetter, and Kastens	Download	PDF		
RSU Building Cost-Rent	Chappetter and Dumler	Download	PDF		
Title	Author	Excel	Corresponding Paper (PDF)	Web Dashboard	Audio (MP3) or Video (WMV)
LAND LEASING AND PURCHASE DECISION TOOLS					
RSU Lease	Chappetter and Kastens	Download	Download		
RSU Landbuy	Chappetter and Kastens	Download	PDF		WMV MP3
RSU Lease: Flex rent dashboard	Chappetter and Kastens	Download		View	
Procedures	Chappetter and Kastens	Download	Download		

## Challenges to ABC

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- Predicting obsolescence and true economic depreciation
- Estimating inflation in replacement costs & technology change
- Which pricing strategy is right?
  - Cover actual costs + margin, or
  - Cover replacement costs + margin
- Capturing indirect OH/support costs essential to specific equip operations

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## Conclusions

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- Critical information for making incremental decisions – expansion, equipment trades
- Provides measurable feedback for process improvement strategies
- Identifies when it's best to in-source vs. outsource
- Sets base for pricing in custom work & trade relationships
- Can be reasonable alternative to cost center tracking & allocation approach

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## Resources

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- Machinery Cost Calculator – Alb Ag  
[www.agric.gov.ab.ca/app24/costcalculators/machinery](http://www.agric.gov.ab.ca/app24/costcalculators/machinery)
- AG Manager Information – Kansas St  
[www.agmanager.info/decision-tools](http://www.agmanager.info/decision-tools)
- Machinery Cost Calculator – Iowa State (William Edwards)  
[www.extension.iastate.edu/agdm](http://www.extension.iastate.edu/agdm)

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