

Getting a Handle on Your Production Costs & Returns



Irrigated Crop Production Update
Lethbridge Lodge Hotel
January 22, 2014

Jason Wood
Production Crops Economist

What's the big deal?



Management decisions



Tools for Better Management

- AgriProfit\$
- Cropping Alternatives
- CropChoice\$



Which crops should I grow?



How many acres?



Will there be a profit?

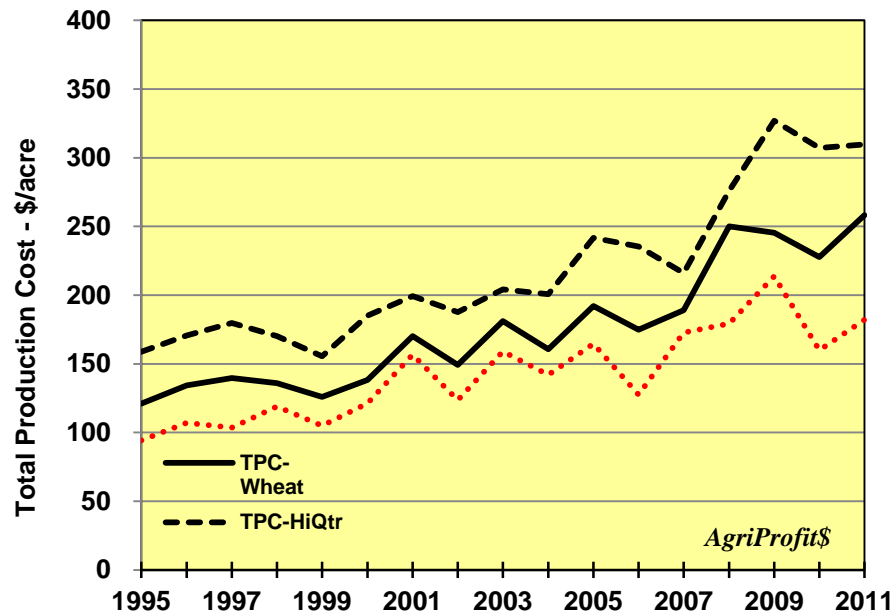


What are my risks?

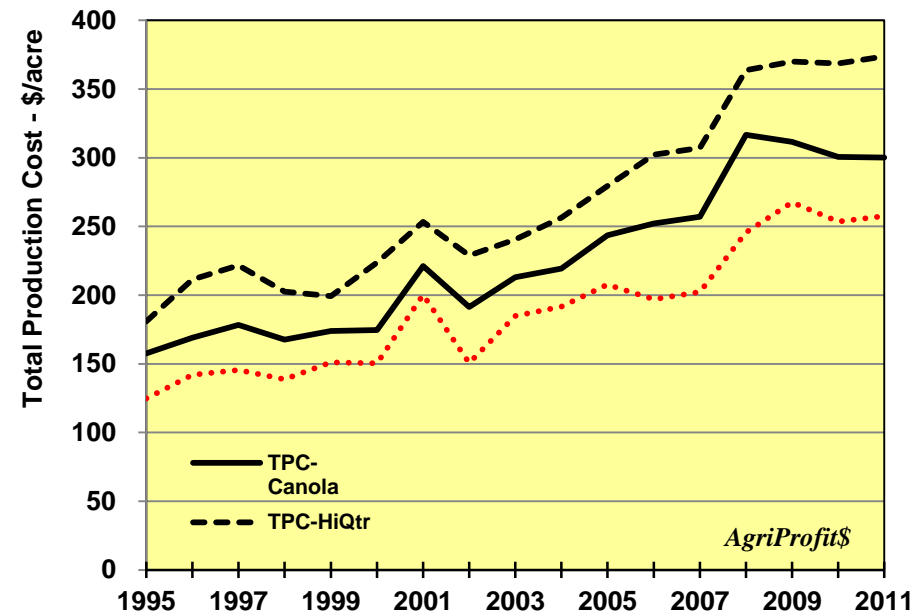


Production Costs

Wheat Production Costs - AB



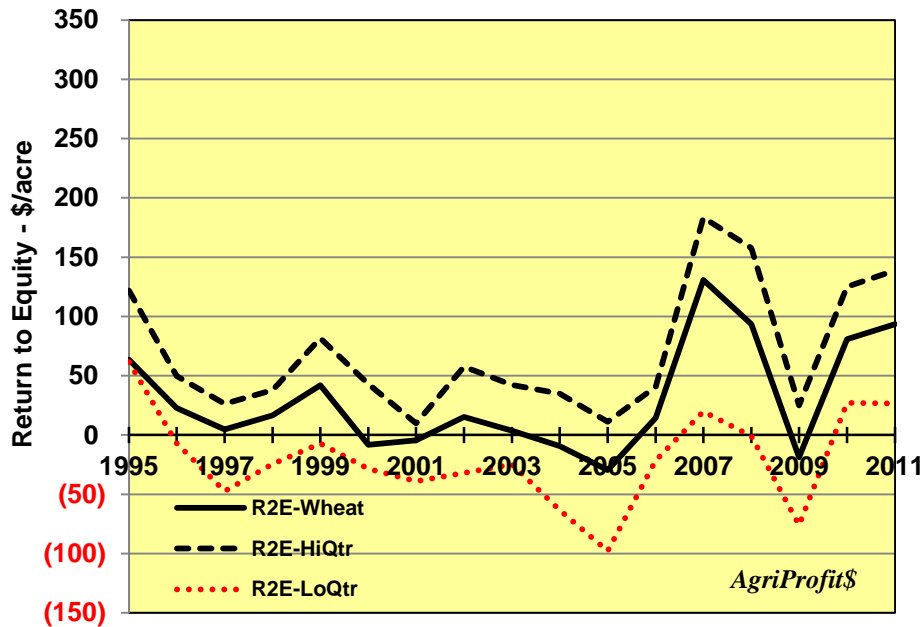
Canola Production Costs - AB



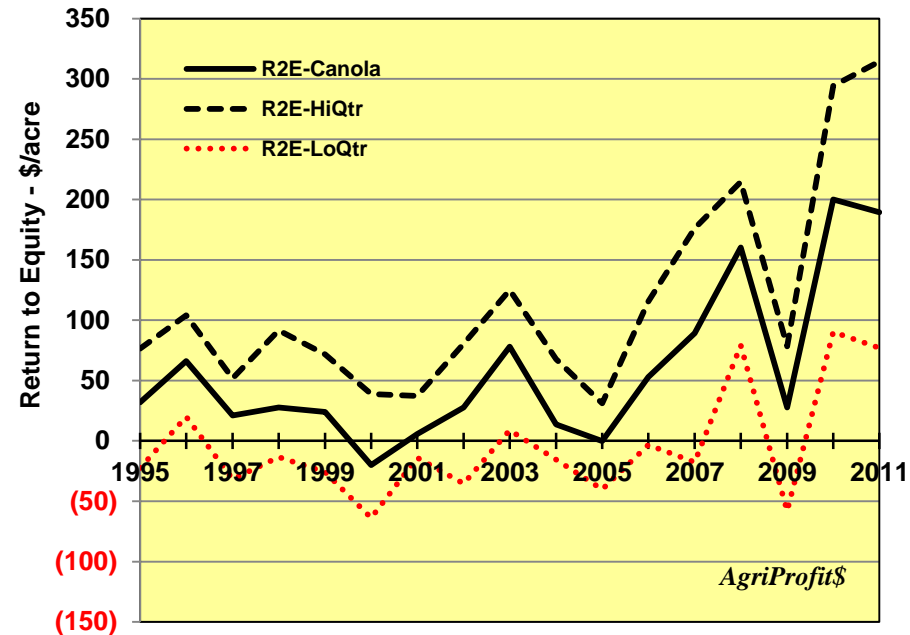
- Irrigated production costs higher
 - Wheat \$180 to 200/acre
 - Canola \$150 to 175/acre

Profits

Wheat Profits - AB



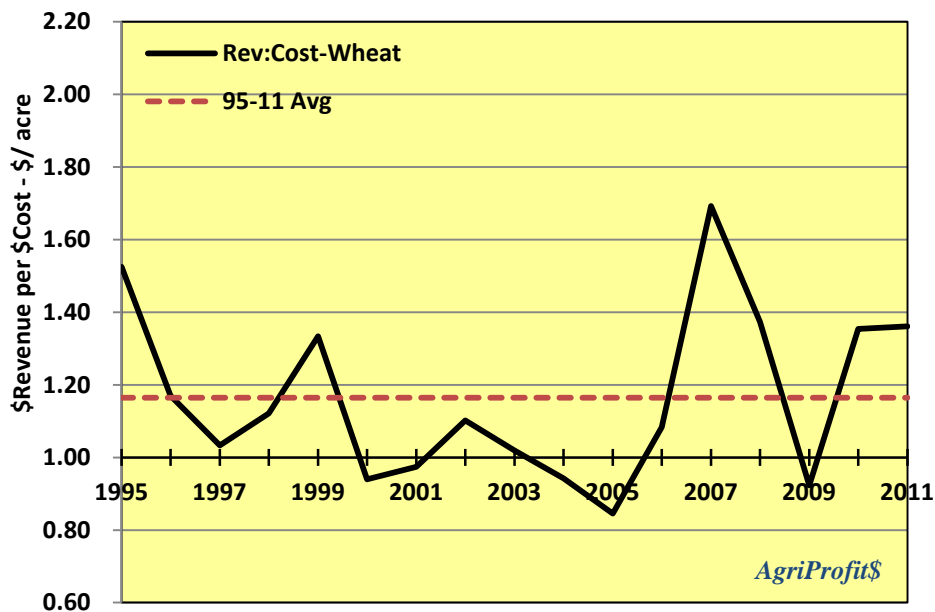
Canola Profits - AB



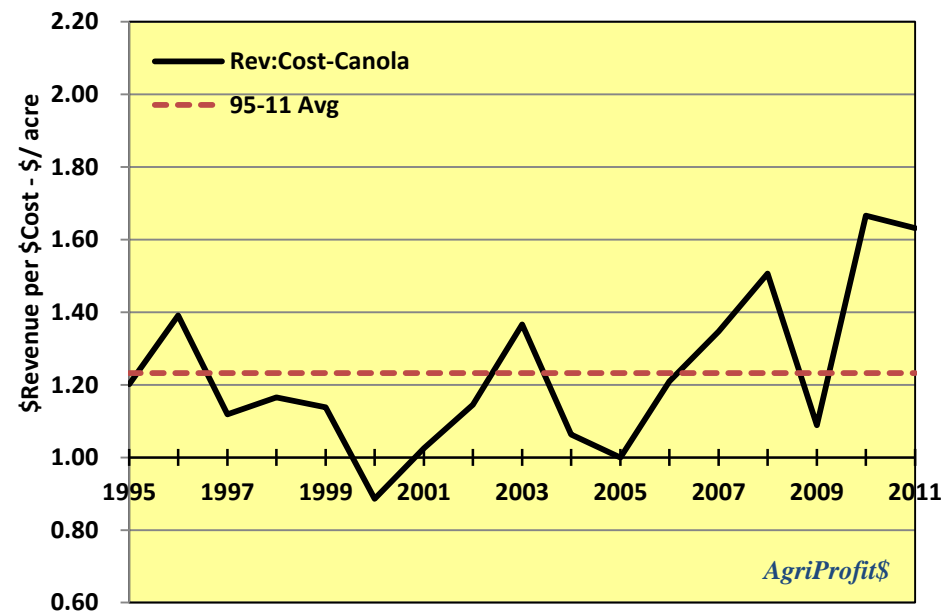
- Irrigated profits differ
 - Wheat lower \$15 to 30/acre
 - Canola higher \$20 to 25/acre

Revenues to Cost

Wheat Revenues:Cost - AB



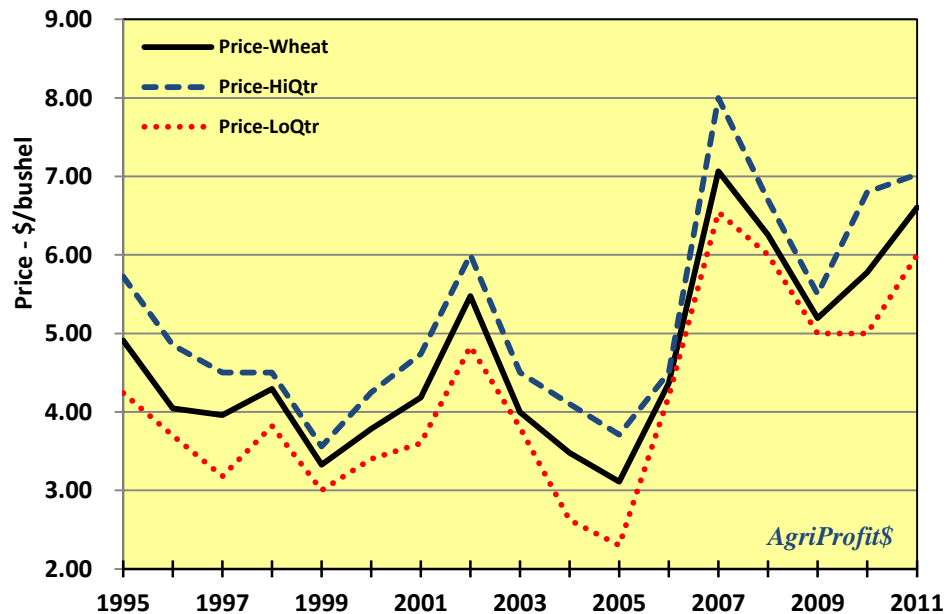
Canola Revenues:Cost - AB



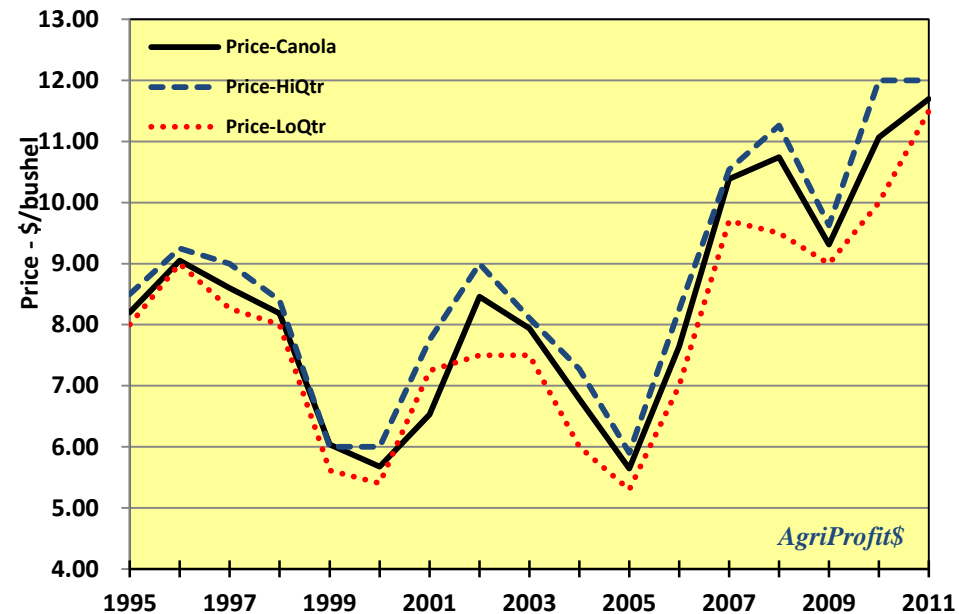
- Irrigated revenue to cost similar for wheat & canola

Prices

Wheat Prices - AB



Canola Prices - AB



AgriProfit\$ Business Analysis & Research Program

- Information
- Benchmarks
- Monitoring

AgriProfit\$ Business Analysis & Research Program

1. Information

- Cost reduction targets
- Goals for each commodity
- Creative



AgriProfit\$ Business Analysis & Research Program

1. Information

2. Benchmarks

- Assessing competitiveness
- Identifying operational strengths and weaknesses
- But...



AgriProfit\$ Business Analysis & Research Program

1. Information
2. Benchmarks
3. **Monitoring**



Cropping Alternatives

- Regional forecast crop budgets
- Expected revenues and costs
- Risk of Benchmark Budgets
- CropChoice\$

Cropping Alternatives

2013 Production Costs and Returns (\$/acre)

Irrigated Soils

Stubble Seeded Crops

| <i>AgriProfit</i> ® | Spring Wheat 1 CWRB 13.8% | CPS Wheat 1 CPBR | Durum Wheat 1 CWAD 13% | Soft Wheat 1 CWSWS | Feed Barley 1 CW | Malt Barley Select CW 2R | Argentine HT Canola 1 CAN | Sugar Beets 22.00 t | Process Potatoes 15.50 t | Dry Beans 1 CAN | Alfalfa Hay 4.00 t | Cereal Silage 12.00 t |
|----------------------------|------------------------------|---------------------|---------------------------|-----------------------|---------------------|-----------------------------|------------------------------|------------------------|-----------------------------|---------------------|-----------------------|--------------------------|
| Expected Yield per Acre | 90.00 bu | 100.00 bu | 100.00 bu | 110.00 bu | 110.00 bu | 95.00 bu | 60.00 bu | 22.00 t | 15.50 t | 2300.00 lbs | 4.00 t | 12.00 t |
| Expected Market Price | 7.62 /bu | 6.94 /bu | 7.08 /bu | 6.40 /bu | 4.57 /bu | 5.23 /bu | 12.02 /bu | 53.00 /t* | 245.00 /t | 0.34 /lb | 80.00 /t | 54.87 /t |
| Crop Sales (\$/acre) | 685.90 | 694.07 | 707.68 | 703.59 | 502.94 | 496.41 | 721.25 | 1166.00 | 3797.50 | 792.74 | 320.00 | 658.39 |
| Direct Expenses | | | | | | | | | | | | |
| Seed, Cleaning & Treatment | 31.85 | 31.23 | 27.22 | 26.13 | 22.86 | 26.13 | 39.66 | 124.90 | 367.17 | 51.70 | 14.88 | 22.86 |
| Fertilizer (NPKS blend) | 92.50 100-40-5-0 | 92.50 100-40-5-0 | 92.50 100-40-5-0 | 99.50 110-40-5-0 | 92.50 100-40-5-0 | 80.50 90-30-5-0 | 112.00 110-50-5-20 | 100.00 100-50-10-0 | 285.00 220-140-110-20 | 85.50 80-50-0-10 | 25.00 5-40-0-0 | 90.00 100-40-0-0 |
| Chemical | 32.00 * | 27.00 | 32.00 * | 32.00 * | 21.00 * | 50.42 * | 44.50 * | 45.45 * | 312.54 * | 62.95 * | 1.88 | 11.50 |
| Hall/Crop Insurance | 25.39 | 28.79 | 29.80 | 28.77 | 20.78 | 20.78 | 23.68 | 10.46 | 0.00 | 49.66 | 0.00 | 0.00 |
| Trucking & Marketing | 18.37 | 20.41 | 20.41 | 22.45 | 17.96 | 15.51 | 10.20 | 88.00 | 162.75 | 13.56 | 6.00 | 18.00 |
| Fuel, Oil & Lube | 23.84 | 26.17 | 26.43 | 26.25 | 28.50 | 28.69 | 27.85 | 55.50 | 135.00 | 43.00 | 42.50 | 31.50 |
| Machinery Repairs | 28.50 | 26.25 | 29.00 | 26.50 | 27.75 | 27.94 | 29.00 | 52.50 | 130.00 | 62.50 | 34.00 | 18.50 |
| Building Repairs | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 3.75 | 20.00 | 4.25 | 1.00 | 1.00 |
| Irrigation: Pumping Costs | 15.25 | 15.00 | 14.75 | 15.00 | 15.00 | 15.00 | 16.00 | 33.00 | 52.80 | 20.00 | 20.00 | 25.00 |
| Custom Work | 8.00 | 8.00 | 9.00 | 9.00 | 12.00 | 12.50 | 7.00 | 44.50 | 132.00 | 29.50 | 8.00 | 33.00 |
| Labour (Paid and Unpaid) | 30.00 | 31.00 | 31.25 | 31.00 | 34.00 | 34.00 | 31.00 | 75.00 | 300.00 | 68.50 | 34.00 | 35.00 |
| Utilities & Miscellaneous | 24.00 | 24.00 | 25.00 | 24.00 | 31.00 | 31.00 | 19.50 | 65.00 | 135.00 | 28.00 | 46.50 | 20.00 |
| Operating Interest | 7.82 | 7.54 | 7.59 | 7.88 | 6.82 | 7.85 | 9.81 | 13.52 | 48.24 | 10.01 | 2.09 | 6.22 |
| Storage and/or Levies | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 20.00 | 160.00 | 0.00 | 0.00 | 0.00 |
| Total Direct Expense | 339.51 | 339.89 | 346.94 | 350.48 | 332.17 | 352.33 | 372.20 | 731.58 | 2240.49 | 529.13 | 235.84 | 312.58 |
| Contribution Margin | 346.39 | 354.18 | 360.74 | 353.11 | 170.77 | 144.08 | 349.05 | 434.42 | 1557.01 | 263.62 | 84.16 | 345.81 |
| Total Cost per Unit | 6.02 | 5.42 | 5.49 | 5.02 | 4.86 | 5.84 | 9.57 | 43.00 | 158.39 | 0.32 | 104.58 | 41.26 |
| Break-Even Yield | 72.00 bu | 79.00 bu | 78.00 bu | 87.00 bu | 117.00 bu | 107.00 bu | 48.00 bu | 18.00 t | 10.00 t | 2158.00 lbs | 5.23 t | 9.02 t |

| Capital Costs by Enterprise | Crops | Forages | Specialty |
|-----------------------------|--------|---------|-----------|
| Crop Share/Cash Rent | 115.00 | 110.00 | 115.00 |
| Licenses and Insurance | 40.00 | 25.00 | 40.00 |
| Depreciation | 86.50 | 90.00 | 92.50 |
| Paid Capital Interest | 18.00 | 12.50 | 24.50 |
| Total Capital Costs | 259.50 | 237.50 | 272.00 |
| Adjusted Capital Costs | 202.00 | 182.50 | 214.50 |

Questions?

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 Note: Please refer to 2013 Methodology on Ropin the Web.

Prepared May 10, 2013



- Western Canada's first computerized crop planning tool
- Evaluates risk & risk management strategies
- Covers all Alberta cropping situations
 - Dryland and irrigation
 - All soil zones
 - 40 crops including forages & special crops
 - Up-to-date crop insurance numbers

How CropChoice\$ Operates

- Calculates “average” crop plan profitability
- Evaluation of risk management strategies:
 - Crop diversification
 - Crop insurance
 - Crop-share land rental options
 - How effective is the proposed strategy?
- It all comes down to managing towards a goal
- Better business decisions

Demo Case

- 3,600 acres
 - HRS Wheat - 600
 - Canola - 300
 - Peas - 300
 - Feed Barley - 400
 - Chem Fallow - 400
 - Alfalfa/Grass Hay – 320
 - Native Grazing – 1,280
- Use regional average costs/acre

Demo Case

- Step 1: Define area & base scenario
 - Label Scenario
 - Enter Township, Range & “West of” (TRW)
 - Enter Soil Type

CropChoice\$ (Version 3.41 - May 4, 2010) - CCS CARA v1.crs (C:_LOCALdata\1 D_Drive\PROJECTS\PE&SBr\9 Training_Wrkshps\2.0 AgriProfit\$\2.7...

Government of Alberta

Open Save

CropChoice\$ - A Second-Generation Decision Tool 2010

Scenario #: 1 Demo Case #1 - Base Township: 28 Range: 7 Meridian: 4 Soil Type: Brown



Demo Case

- Step 2: Enter crop plan
 - Acreage by crop type
 - Price & yield expectations using key questions:
 - Most likely price and yield
 - Lowest likely price and yield
 - Highest likely price and yield
 - Adjust costs as appropriate

Demo Case

- Step 2: Enter crop plan

| CC\$ CARA v1 | ✓ Field # 1 | ✓ Field # 2 | ✓ Field # 3 | ✓ Field # 4 | ✓ Field # 5 | ✓ Field # 6 | ✓ Field # 7 |
|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Field Description | | | | | | | |
| Acres | 600 | 300 | 300 | 400 | 400 | 320 | |
| Crops * | wht_hrs | canola_arg | peas_field | barley_feed | mixe | hay_leg | hay_mixe |
| Stubble, Fallow or Irrigated | Stubble | Stubble | Stubble | Stubble | Stubble | Stubble | Stubble |
| Unit | bushels | bushels | bushels | bushels | bushels | tonnes | tonnes |
| Worst Possible Yield/Acre * | 20.0 | 15.0 | 20.0 | | | 0.3 | |
| Best Possible Yield/Acre | 45.0 | 40.0 | 45.0 | | | 1.0 | |
| Most Likely Yield/Acre | 30.0 | 30.0 | 30.0 | | | | |
| Worst Possible Price * | 2.50 | 5.00 | 5.00 | 1.50 | 0.01 | 65.00 | |
| Best Possible Price | 10.00 | 15.00 | 8.00 | 4.00 | 0.03 | 85.00 | |
| Most Likely Price | 7.00 | 10.00 | 6.50 | 2.75 | 0.02 | 75.00 | |
| Crop Insurance * | <input type="checkbox"/> CI | <input type="checkbox"/> CI | <input type="checkbox"/> CI | <input type="checkbox"/> CI | <input type="checkbox"/> CI | <input type="checkbox"/> CI | <input type="checkbox"/> CI |
| Spring Price Endorsement | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE | <input type="checkbox"/> SPE |
| Coverage Level | | | | | | | |
| Individual Base Coverage * | | | | | | | |

\$2.50

\$10.00



Demo Case

- Step 2: ...
check costs

| | | | | | | |
|----------------------------------|--------|--------|--------|--------|-------|-------|
| Seed * | 12.90 | 23.95 | 25.86 | 8.49 | 0.00 | 0.00 |
| Fertilizer | 32.00 | 42.00 | 13.50 | 32.00 | 0.00 | 11.50 |
| Chemicals | 27.30 | 28.55 | 24.44 | 24.54 | 10.50 | 1.43 |
| Crop Insurance Premiums | | | | | | |
| Trucking & Marketing | 6.53 | 3.40 | 6.53 | 7.84 | 0.00 | 15.00 |
| Fuel, Oil & Lube | 11.00 | 12.81 | 11.00 | 12.00 | 6.00 | 13.50 |
| Irrigation Fuel & Electricity | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Repairs - Machinery | 9.00 | 8.50 | 8.50 | 8.75 | 6.90 | 7.50 |
| Repairs - Buildings | 1.00 | 1.00 | 1.00 | 1.00 | 0.25 | 0.50 |
| Utilities & Misc. Expenses | 8.50 | 8.50 | 8.50 | 8.50 | 2.40 | 6.00 |
| Custom Work & Specialized Labour | 1.50 | 3.00 | 3.00 | 1.50 | 0.60 | 3.00 |
| Operating Interest Paid | 3.97 | 5.20 | 3.51 | 3.58 | 1.00 | 0.64 |
| Paid Labour & Benefits | 6.00 | 6.00 | 6.00 | 6.00 | 0.75 | 5.00 |
| Unpaid Labour | 6.00 | 6.00 | 6.00 | 6.00 | 3.00 | 5.00 |
| Total Variable Costs | 125.70 | 148.91 | 117.84 | 120.20 | 31.40 | 69.07 |
| Cash Rent * | | | | | | |
| or Share Crop - Landlord % * | | | | | | |
| Seed/Fert/Chem - Landlord % | | | | | | |
| or \$/acre | | | | | | |
| Tenant's Other Exp.\$/acre | | | | | | |
| Taxes, Water Rates, Lic | 4.50 | 4.50 | 4.50 | 4.50 | 4.00 | 2.50 |
| Paid Capital Interest | 7.25 | 7.25 | 7.25 | 7.25 | 7.25 | 4.50 |
| Fixed Cash Costs | 11.75 | 11.75 | 11.75 | 11.75 | 11.25 | 7.00 |



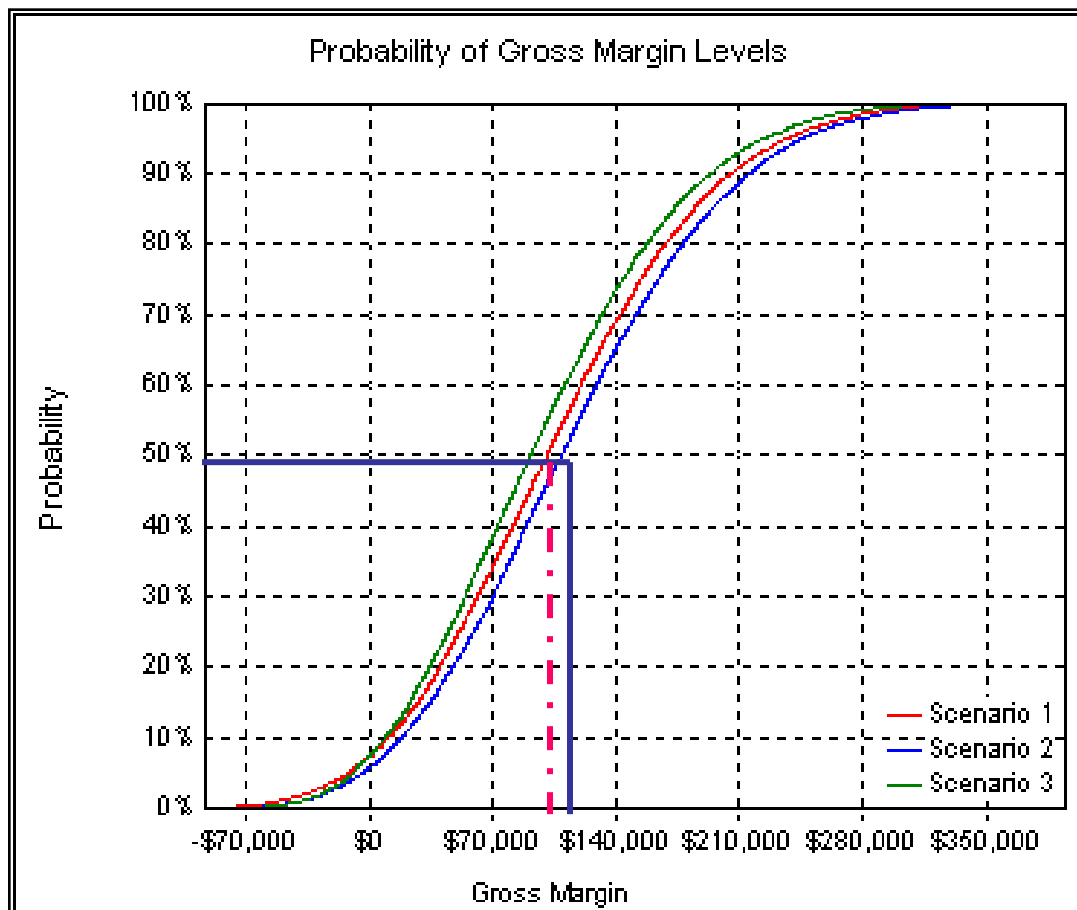
Demo Case

- Step 3: Run Simulation and examine results
 - 3 presentations of results:
 - Tabular
 - Cumulative probability distribution
 - Risk-return tradeoff
 - Information on the expected outcome
 - Variability for each crop plan scenario

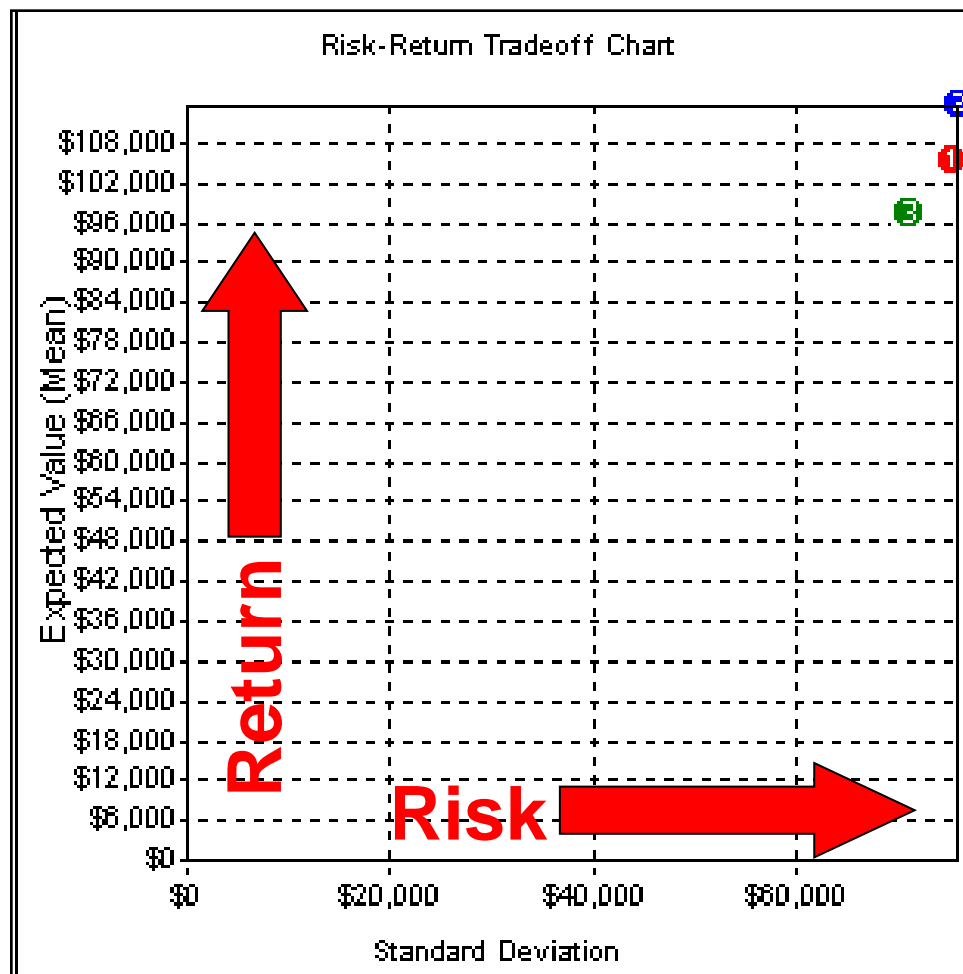
Demo Case

| | Scenario 1 | Scenario 2 | Scenario 3 |
|--|----------------|-----------------------------|---------------------------|
| Description | Case #1 - Base | Case #1 - Base & Cost Red'n | C#1 - Base & Cost R. & CI |
| Expected Contribution Margin | \$119,099 | \$127,847 | \$111,353 |
| Standard Deviation of CM | \$75,476 | \$76,128 | \$71,208 |
| Coefficient of Variation of CM | 63.37% | 59.55% | 63.95% |
| Expected Gross Margin | \$104,948 | \$113,696 | \$97,201 |
| Standard Deviation of GM | \$75,476 | \$76,128 | \$71,208 |
| Coefficient of Variation of GM | 71.92% | 66.96% | 73.26% |
| The chance of Gross Margin below \$0 is: | 7.37% | 5.73% | 7.46% |
| The chance of GM below \$20,000 is: | 12.59% | 10.61% | 13.73% |
| The chance of GM below \$10,000 is: | 9.78% | 7.98% | 10.32% |
| There is a 10% chance of a GM below: | \$10,755 | \$17,756 | \$8,858 |

Demo Case




Demo Case



Reports & Summaries

Summary of Input Data

Scenario # 4 Base Scenario 5 Crop Insurance



Crop Insurance Risk Map 7
Roll Type: Blank

| | Base #1 | Base #2 |
|-----------------|----------|----------|
| Base Scenario 1 | Base #1 | Base #2 |
| 2000 | 100 | 100 |
| 2001 | 1000,000 | 1000,000 |
| 2002 | 1000,000 | 1000,000 |
| 2003 | 1000,000 | 1000,000 |
| 2004 | 1000,000 | 1000,000 |
| 2005 | 1000,000 | 1000,000 |
| 2006 | 1000,000 | 1000,000 |
| 2007 | 1000,000 | 1000,000 |
| 2008 | 1000,000 | 1000,000 |
| 2009 | 1000,000 | 1000,000 |
| 2010 | 1000,000 | 1000,000 |
| 2011 | 1000,000 | 1000,000 |
| 2012 | 1000,000 | 1000,000 |
| 2013 | 1000,000 | 1000,000 |
| 2014 | 1000,000 | 1000,000 |
| 2015 | 1000,000 | 1000,000 |
| 2016 | 1000,000 | 1000,000 |
| 2017 | 1000,000 | 1000,000 |
| 2018 | 1000,000 | 1000,000 |
| 2019 | 1000,000 | 1000,000 |
| 2020 | 1000,000 | 1000,000 |
| 2021 | 1000,000 | 1000,000 |
| 2022 | 1000,000 | 1000,000 |
| 2023 | 1000,000 | 1000,000 |
| 2024 | 1000,000 | 1000,000 |
| 2025 | 1000,000 | 1000,000 |
| 2026 | 1000,000 | 1000,000 |
| 2027 | 1000,000 | 1000,000 |
| 2028 | 1000,000 | 1000,000 |
| 2029 | 1000,000 | 1000,000 |
| 2030 | 1000,000 | 1000,000 |
| 2031 | 1000,000 | 1000,000 |
| 2032 | 1000,000 | 1000,000 |
| 2033 | 1000,000 | 1000,000 |
| 2034 | 1000,000 | 1000,000 |
| 2035 | 1000,000 | 1000,000 |
| 2036 | 1000,000 | 1000,000 |
| 2037 | 1000,000 | 1000,000 |
| 2038 | 1000,000 | 1000,000 |
| 2039 | 1000,000 | 1000,000 |
| 2040 | 1000,000 | 1000,000 |
| 2041 | 1000,000 | 1000,000 |
| 2042 | 1000,000 | 1000,000 |
| 2043 | 1000,000 | 1000,000 |
| 2044 | 1000,000 | 1000,000 |
| 2045 | 1000,000 | 1000,000 |
| 2046 | 1000,000 | 1000,000 |
| 2047 | 1000,000 | 1000,000 |
| 2048 | 1000,000 | 1000,000 |
| 2049 | 1000,000 | 1000,000 |
| 2050 | 1000,000 | 1000,000 |
| 2051 | 1000,000 | 1000,000 |
| 2052 | 1000,000 | 1000,000 |
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| 2055 | 1000,000 | 1000,000 |
| 2056 | 1000,000 | 1000,000 |
| 2057 | 1000,000 | 1000,000 |
| 2058 | 1000,000 | 1000,000 |
| 2059 | 1000,000 | 1000,000 |
| 2060 | 1000,000 | 1000,000 |
| 2061 | 1000,000 | 1000,000 |
| 2062 | 1000,000 | 1000,000 |
| 2063 | 1000,000 | 1000,000 |
| 2064 | 1000,000 | 1000,000 |
| 2065 | 1000,000 | 1000,000 |
| 2066 | 1000,000 | 1000,000 |
| 2067 | 1000,000 | 1000,000 |
| 2068 | 1000,000 | 1000,000 |
| 2069 | 1000,000 | 1000,000 |
| 2070 | 1000,000 | 1000,000 |
| 2071 | 1000,000 | 1000,000 |
| 2072 | 1000,000 | 1000,000 |
| 2073 | 1000,000 | 1000,000 |
| 2074 | 1000,000 | 1000,000 |
| 2075 | 1000,000 | 1000,000 |
| 2076 | 1000,000 | 1000,000 |
| 2077 | 1000,000 | 1000,000 |
| 2078 | 1000,000 | 1000,000 |
| 2079 | 1000,000 | 1000,000 |
| 2080 | 1000,000 | 1000,000 |
| 2081 | 1000,000 | 1000,000 |
| 2082 | 1000,000 | 1000,000 |
| 2083 | 1000,000 | 1000,000 |
| 2084 | 1000,000 | 1000,000 |
| 2085 | 1000,000 | 1000,000 |
| 2086 | 1000,000 | 1000,000 |
| 2087 | 1000,000 | 1000,000 |
| 2088 | 1000,000 | 1000,000 |
| 2089 | 1000,000 | 1000,000 |
| 2090 | 1000,000 | 1000,000 |
| 2091 | 1000,000 | 1000,000 |
| 2092 | 1000,000 | 1000,000 |
| 2093 | 1000,000 | 1000,000 |

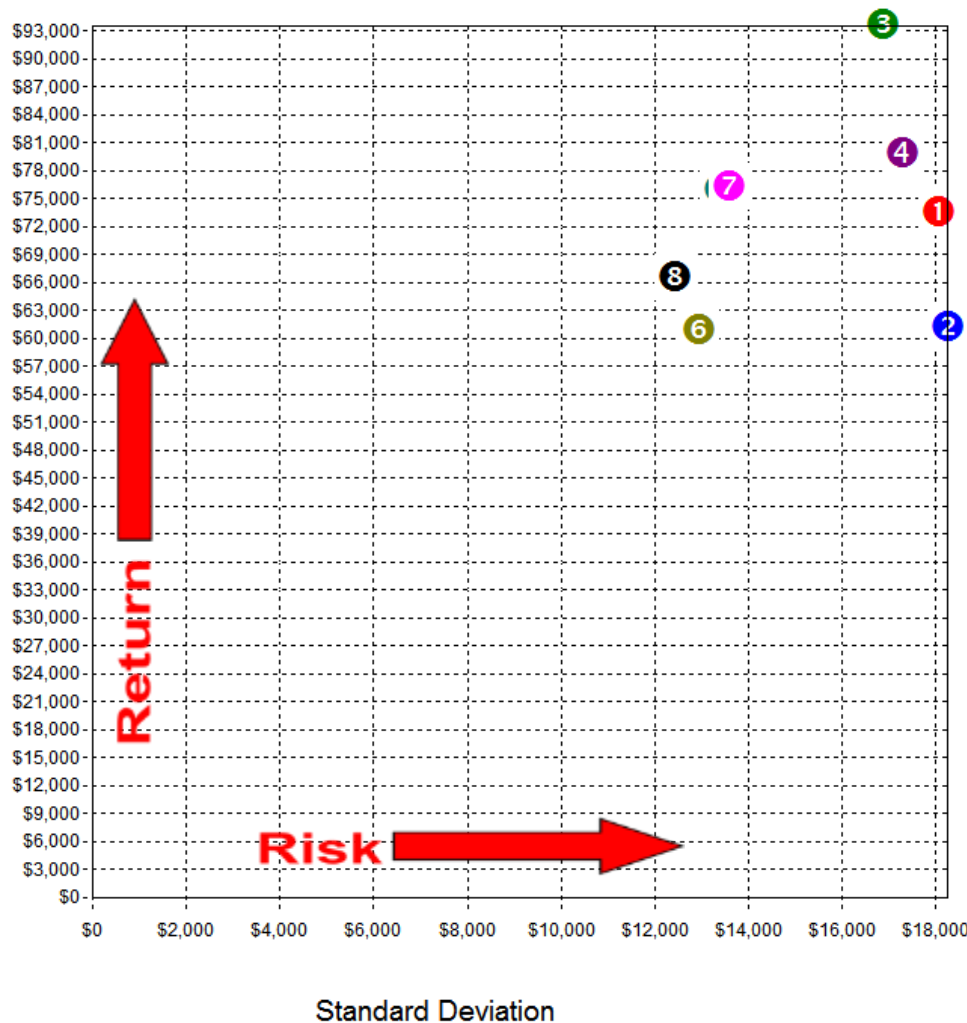
Scenario Analysis - Contribution and Gross Margins

| | Scenario 1 Data Scenario 1 100% 100 0% | Scenario 2 Data Scenario 2 10% 100 90% | Scenario 3 Data Scenario 3 20% 100 80% | Scenario 4 Data Scenario 4 30% 100 70% | Scenario 5 Data Scenario 5 40% 100 60% | Scenario 6 Data Scenario 6 50% 100 50% | Scenario 7 Data Scenario 7 60% 100 40% | Scenario 8 Data Scenario 8 70% 100 30% |
|------------------------------|--|--|--|--|--|--|--|--|
| Scenario Contribution Margin | 412,214 | 417,089 | 417,735 | 420,711 | | | | |
| Contribution margin ratio | 0.3088 | 0.3103 | 0.3109 | 0.3120 | | | | |
| Contribution margin/100 | 11.266 | 12.454 | 12.474 | 12.624 | | | | |
| Scenario Gross Margin | 417,209 | 420,697 | 421,690 | 424,997 | | | | |
| Gross margin ratio | 0.3288 | 0.3303 | 0.3309 | 0.3320 | | | | |
| Gross margin/100 | 32.884 | 33.034 | 33.094 | 33.204 | | | | |
| Gross margin | 9,319 | 10,219 | 10,219 | 10,219 | | | | |
| Gross margin ratio | 0.3288 | 0.3303 | 0.3309 | 0.3320 | | | | |
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| Gross margin/100 | 32.884 | 33.034 | 33.094 | 33.204 | | | | |
| Gross margin | 9,319 | 10,219 | 10,219 | 10,219 | | | | |
| Gross margin ratio | 0.3288 | 0.3303 | 0.3309 | 0.3320 | | | | |
| Gross margin/100 | 32.884 | 33.034 | 33.094 | 33.204 | | | | |
| Gross margin | 9,319 | 10,219 | 10,219 | 10,219 | | | | |
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[illegible]

Application of CropChoice\$

Risk-Return Tradeoff Chart



- 1=CC
- 2=WW
- 3=WC
- 4=CCW
- 5=PCW
- 6=WBC
- 7=CPW
- 8=FCW
- What would you do?

Change is Inevitable, Growth is Optional



Does it Pay?

Is it worth the risk?

↑ *Knowledge* = ↑ *Profit* & ↓ *Risk*

Questions / Comments

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By the way

Statistics show that:

Economists can predict with 100% certainty
most of what happened yesterday