WASHINGTON STATE UNIVERSITY

World Class. Face to Face.

# Economic Returns to Canola Rotations in Eastern Washington

**Vicki McCracken, Associate Director and Professor,**
**mccracke@wsu.edu**
**Jenny Ringwood, Associate in Research**
**School of Economic Sciences, WSU**

**NW Bioenergy Research Symposium, Nov. 13, 2012**

# Summary

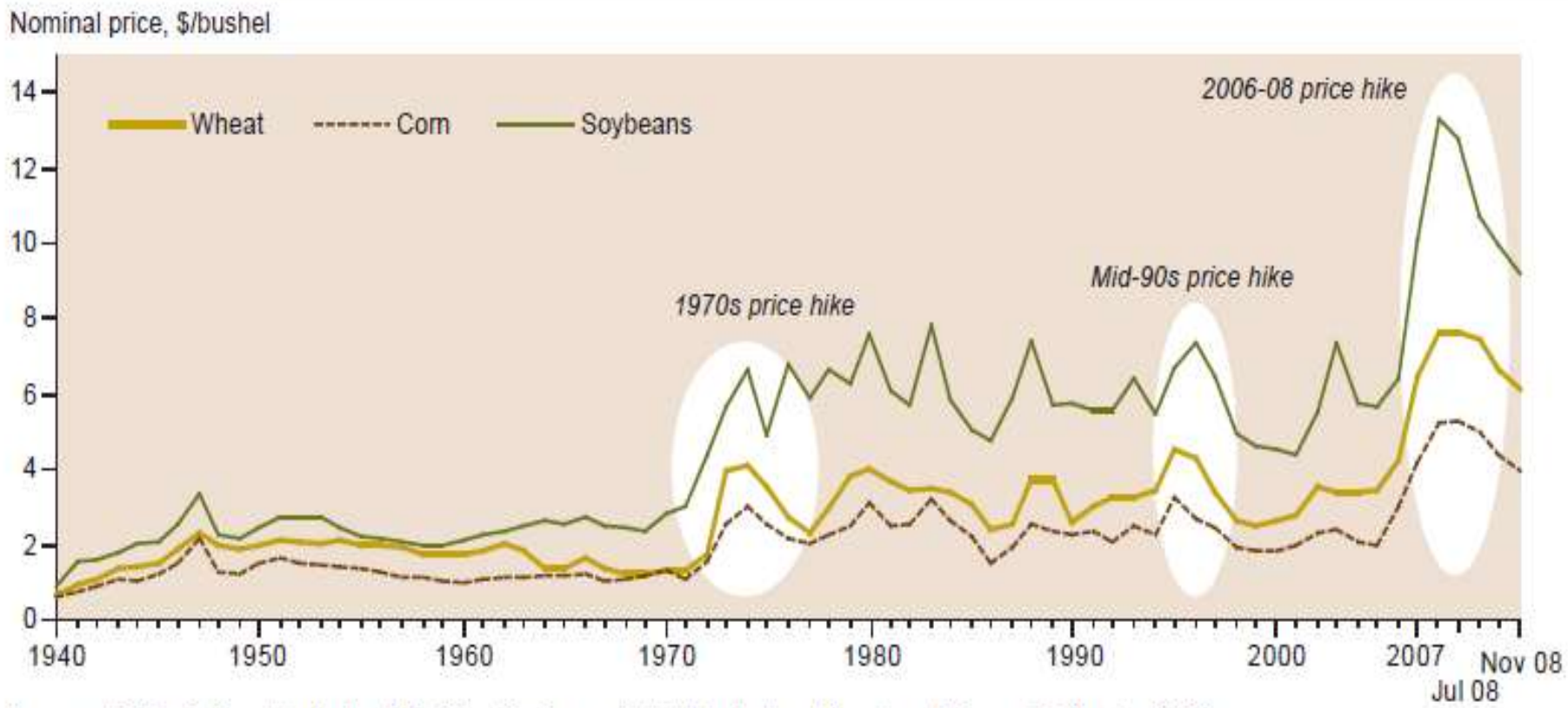
- Inclusion of canola into crop rotations may offer agronomic benefits to farms that translate into improved overall farm profitability over time.

- Our research – Finds favorable economic returns of selected crop rotations that incorporate canola as compared to returns of traditional crop rotations appropriate to each region, based on scenarios considered.

# Overview of Presentation

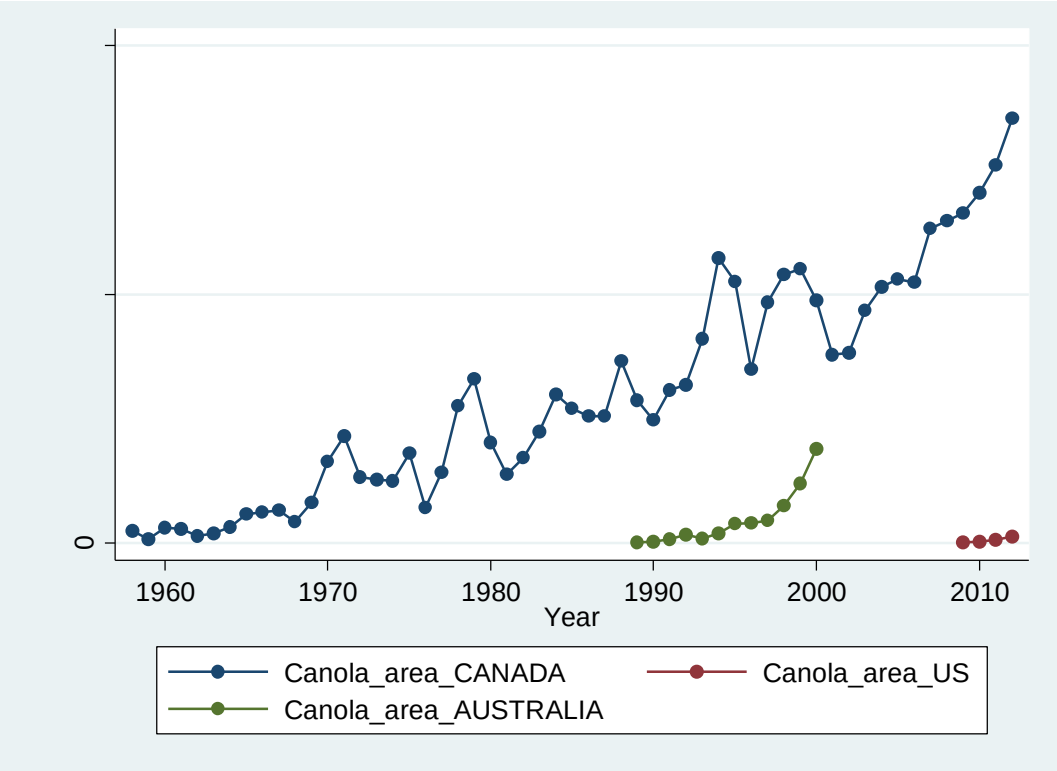
- Background on current economic outlook for oilseed production
- Comments on State Mandated Report:  Biofuel Economics and Policy for Washington State, 2008
- Goal/Methodology of current research
- Selected findings and next steps

# Price Trends for Oilseeds and Cereals, 1940 – 2009

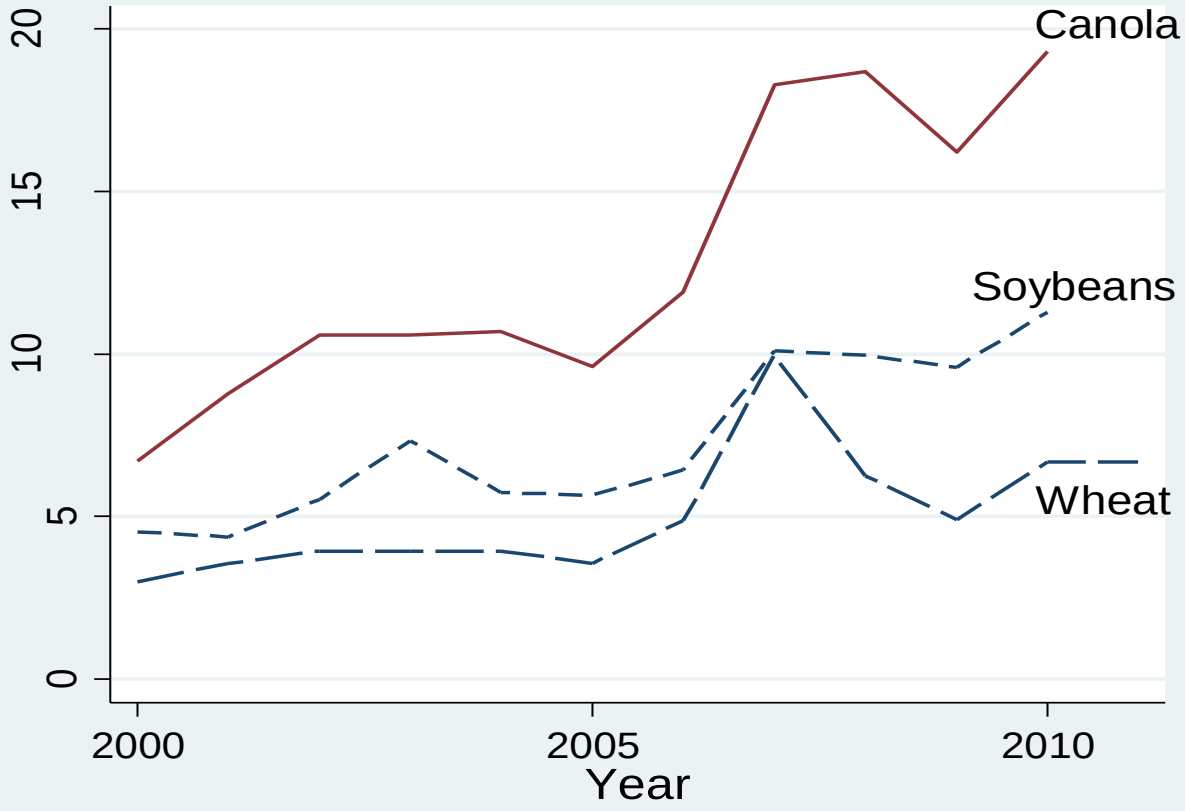



Sources: USDA, National Agricultural Statistics Service and World Agricultural Supply and Demand Estimates, 2008.

# Canola Area (hectares), by Production Area



# National Price Trends for Canola, Soybeans and Wheat




Price Trends- 2000 to 2010

# Biofuel Economics and Policy for Washington State, 2008

- Mandated study, conducted by economists/ag economist at WSU
- Focused on effectiveness of various policy alternatives to achieve biofuels related goals in WA State
- Approach appropriately looked at macro level impacts, within context of state and federal policies and the world context of markets for ag commodities for food and fuel, accounting for the traditional rotations for the state

# Biofuel Economics and Policy for Washington State, 2008

Policy Goals Considered:

1. Increase in-state production of biofuels
2. Increase in-state production of biofuel feedstocks
3. Reduced petroleum dependence
4. Reduced carbon emissions
5. Fostering environmental sustainability

# Biofuel Economics and Policy for Washington State, 2008

- Policy Goal 2 (WA farmers growing biofuel feedstocks) links to our research and we only focus on canola
- Mandated research appropriately forecasted limited growth in canola production based on historical data and limited farmer experience with canola (relative to other crops)
  - Did not consider rotational effects of canola in a system
  - Assumed a 20% price dockage (yield) due to lack of grower experience with canola.
  - Advances in agronomics and varieties

# Wheat yields with new varieties releases from WSU Variety Testing Program, 1970-2005

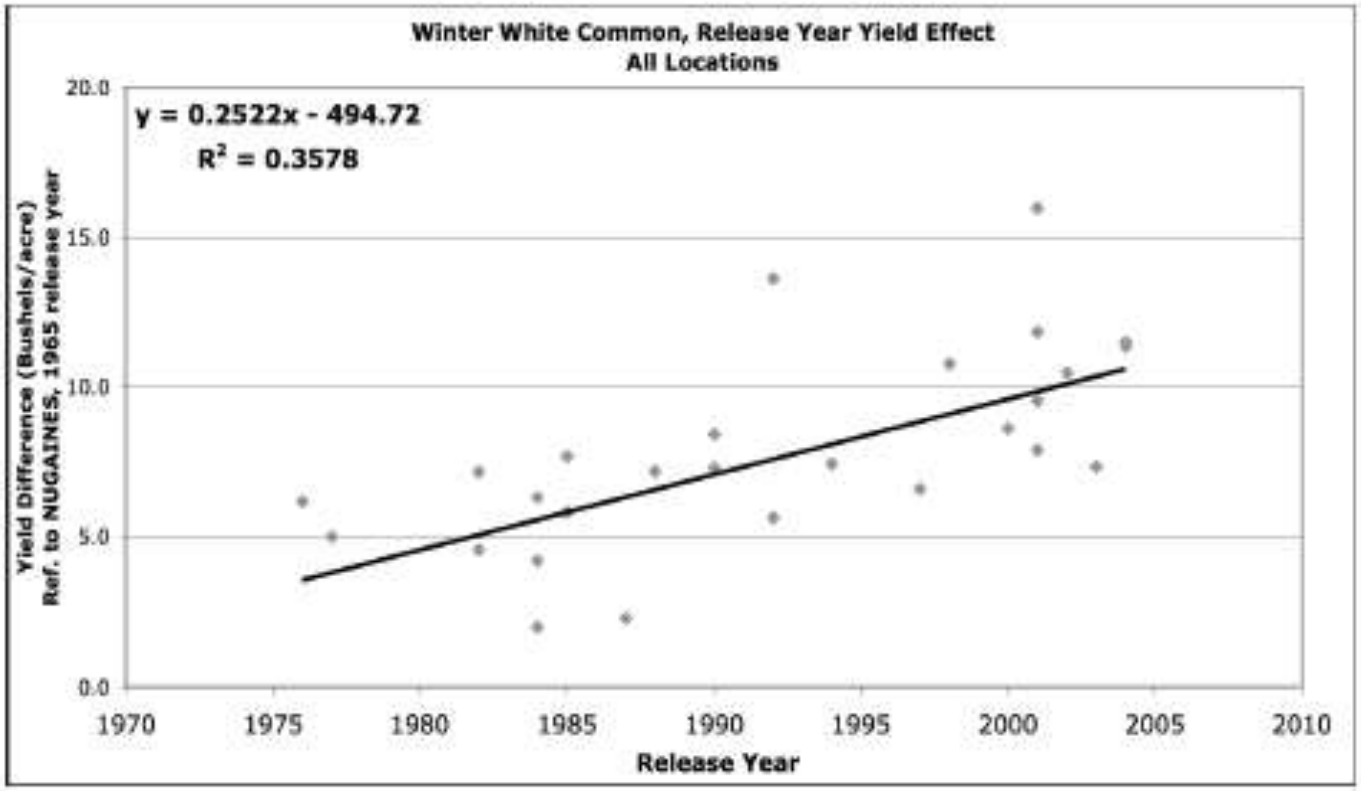
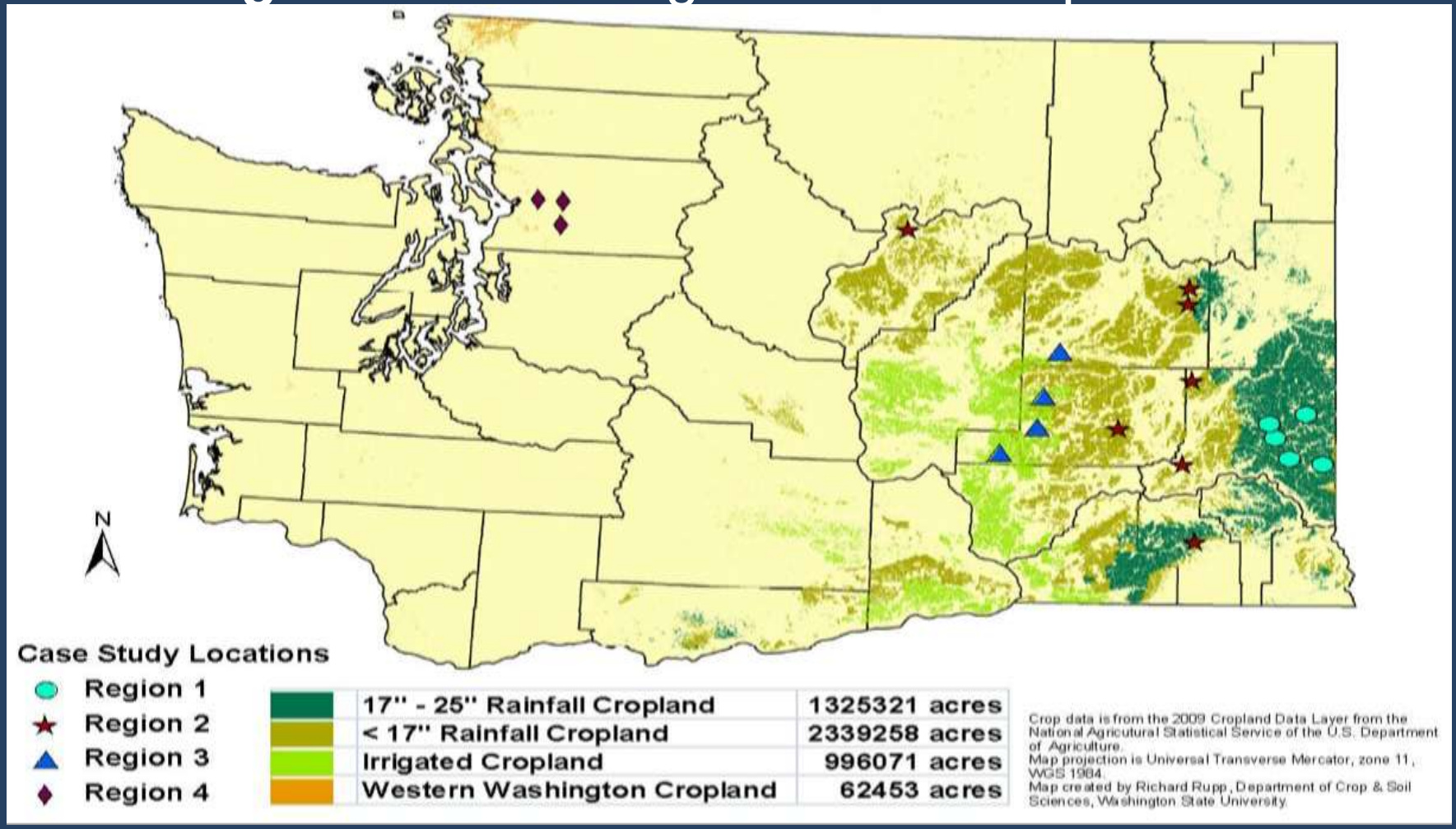



Figure 2.2. Winter white common variety performance referenced to NUGAINES by release year.

# **Figure 1:** Washington State Crop



# Methodology

- Economic returns of rotations estimated using enterprise budgets created by Kate Painter
- Valuations used market prices and inputs costs for 2012 season and average yields for the crop region
- Rotational impacts on yield and inputs were incorporated when data was available based on grower input and expert opinion
- Used projected yields and inputs costs for non-traditional systems
- Rotation returns computed assuming equal acreage of each rotation
- Assumed all canola is Roundup Ready

# Selected Scenarios–Regions 1 and 2

**Region 1**

- Annual Cropping – Replace spring legume with canola
- Transition area – Replace fallow with canola

**Region 2**

- Fallow system – Canola replace every other fallow
- Fallow system – Move from 2 year to 3 year rotation with canola

Scenarios for Conventional vs. Reduced tillage

Detailed results on Poster shown tonight!

# Region 1: Transition Zone – Replace Chemical Fallow with Spring Canola

| | Returns over Total Costs ($/ac/yr) | Returns over Variable Costs ($/ac/yr) |
|---|---|---|
| ROTATION/Scenario | | |
| **Baseline – WW (78), SW (42), SC (2000)** | | |
| WW, HRSW, SC | **$166** | **$284** |
| WW, HRSW, CF | $57 | $200 |
| WW, SB, CF | $48 | $184 |
| **Low Canola Yields, no rotational effects** | | |
| WW, HRSW, SC | **$73** | $191 |
| WW, HRSW, CF | $57 | **$200** |
| WW, SB, CF | $48 | $184 |
| **Low Canola Yields, Rotational effects (+15%WW)** | | |
| WW, HRSW, SC | **$99** | **$218** |
| WW, HRSW, CF | $57 | $200 |
| WW, SB, CF | $48 | $184 |

# Region 2: Fallow Systems- Winter Canola every other WW-Fallow Cycle, Reduced Till and Various Scenarios

| | Returns over Total Costs ($/ac/yr) | Returns over Variable Costs ($/ac/yr) |
|---|---|---|
| ROTATION/Scenario | | |
| Baseline – SWWW (50), WC (1500) | | |
| CF, WW, CF, WW | $32 | $74 |
| CF, WW, CF, WC | **$37** | **$76** |
| | | |
| +20% Wheat Price, no rotational impact | | |
| CF, WW, CF, WW | **$66** | **$132** |
| CF, WW, CF, WC | $54 | **$132** |
| | | |
| +20% Wheat Price, Rotational impact (+20% WW) | | |
| CF, WW, CF, WW | $66 | $132 |
| CF, WW, CF, WC | **$95** | **$173** |

# Conclusions

- Inclusion of canola **increased input costs** of all rotation systems considered.
- Recent and current **prices for all crops** result in positive returns (short and longer run) for all rotations.
- In scenarios where **only low canola yields** were considered, canola (in rotations) still had positive returns but often second to other rotations; however when the **rotational impacts** were considered, rotations with canola provided the highest returns.
- Work on budgets is **on-going** - incorporation of location (different transportation costs), budgets usable by producers, new rotations including irrigated systems, etc.

# Quotes from Growers

- "We need an oilseed that will complement winter wheat, not compete with it."
  - Region 1 Annual Cropping Farmer

- "Canola is not more valuable than wheat until you look at the whole picture"
  - Region 2 Farmer

# Additional Graphs/Tables of Results

# Region 1: Annual Cropping - Replace Spring Legume with Spring Canola

| | Returns over Total Costs ($/ac/yr) | Returns over Variable Costs ($/ac/yr) |
|---|---|---|
| ROTATION/Scenario | | |
| Baseline – WW (85), SW (65), SC (1900) | | |
| WW, SWSW, SP | $103 | $254 |
| WW, SWSW, SC | **$118** | **$291** |
| | | |
| Low Canola Yields, no rotational impacts | | |
| WW, SWSW, SP | **$103** | **$254** |
| WW, SWSW, SC | $53 | $225 |
| | | |
| Low Canola Yields, Rotational impact (+20%WW) | | |
| WW, SWSW, SP | **$103** | $254 |
| WW, SWSW, SC | $92 | **$264** |
| | | |

# Region 2: Fallow Systems - Winter Canola every other WW-Fallow Cycle

| | Returns over Total Costs ($/ac/yr) | Returns over Variable Costs ($/ac/yr) |
|---|---|---|
| ROTATION/Scenario | | |
| Baseline – SWWW (50), WC (1500) | | |
| Conventional Till | | |
| SF, WW, SF, WW | $37 | $130 |
| SF, WW, SF, WC | **$40** | **$145** |
| | | |
| Reduced Till | | |
| CF, WW, CF, WW | $32 | $74 |
| CF, WW, CF, WC | **$37** | **$76** |
| | | |
| | | |

# Region 2: Fallow Systems – Move from 2-year to 3-year rotation with canola

| | Returns over Total Costs ($/ac/yr) | Returns over Variable Costs ($/ac/yr) |
|---|---|---|
| ROTATION/Scenario | | |
| Baseline – SWWW (50), WC (1500) | | |
| Conventional Till | | |
| SF-WW-SF-WW-SF-WW | $26 | $130 |
| SF-WW-SC, SF-WW-SC | **$44** | **$153** |
| | | |
| Reduced Till | | |
| CF-WW-CF-WW-CF-WW | $20 | $98 |
| CF-WW-SC, CF-WW-SC | **$56** | **$178** |
| | | |
| | | |

# Region 2: Fallow Systems – Move from 2-year to 3-year rotation with canola, Reduced Tillage

| | Returns | Returns |
|---|---|---|
| | over Total | over Variable |
| ROTATION/Scenario | Costs | Costs |
| | ($/ac/yr) | ($/ac/yr) |
| Baseline – SWWW (50), WC (1500) | | |
| CF-WW-CF-WW-CF-WW | $20 | $98 |
| CF-WW-SC, CF-WW-SC | **$56** | **$178** |
| | | |
| Low Canola Yields (1200) | | |
| CF-WW-CF-WW-CF-WW | $20 | $98 |
| CF-WW-SC, CF-WW-SC | **$28** | **$149** |
| | | |
| | | |

# Annual Average National Oilseed Prices