

# Machinery costs, costs per bushel and net returns for direct seed wheat production: Results by agroecological class (AEC) and year, based on a grower survey

## Introduction

Costs and returns for winter wheat production differ significantly across the inland PNW wheat production region. Based on a longitudinal survey of direct seed producers, machinery costs account for 16% – 18% of total production costs, including both operating and ownership costs. Typical costs by AEC are described below, plus survey results grouped by year and AEC.

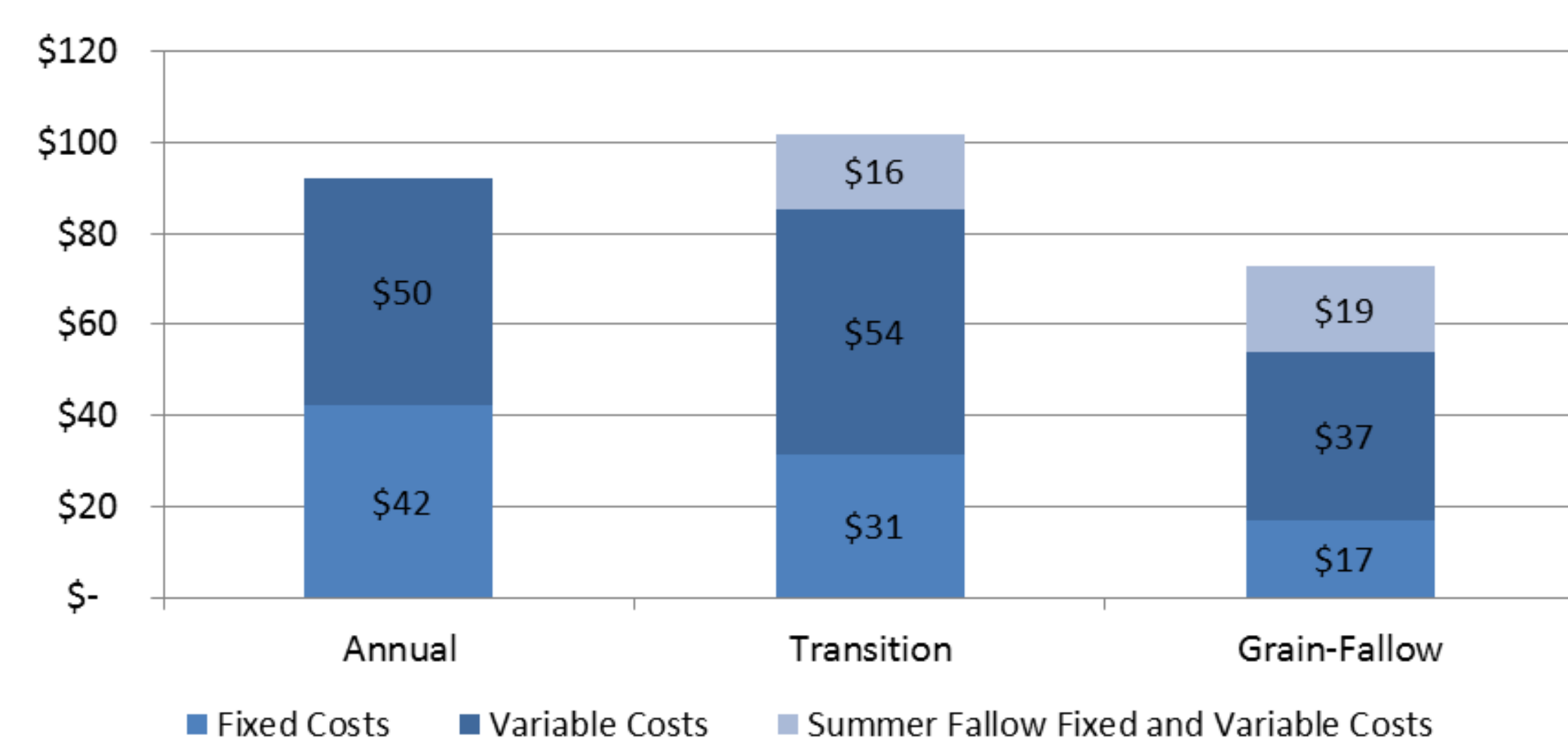
## The Farmers of the Longitudinal Survey

This group of wheat growers were invited to participate in the REACCH project based on their willingness to collaborate with previous research projects. These producers are characterized by being leaders in their communities, having a long farming history, and by their willingness to adopt new practices.

## Agroecological Class (AEC)

Agroecological classes divide the wheat growing region in the Inland PNW based on cropping intensity. The **Annual** AEC is characterized by annual production, while the **Transition** AEC produces a crop in two of every three years. The **Wheat-Fallow** AEC typically has a two-year rotation of winter wheat and summer fallow. There are 20 survey participants in the Annual AEC, 11 in the Transition AEC, and 14 in the Grain-Fallow AEC.

### Typical Direct Seed Winter Wheat Machinery Costs by Agroecological Class (\$ per acre)



**Variable costs** are directly related to production, for machinery costs these include fuel, lubricants, repairs, and labor.

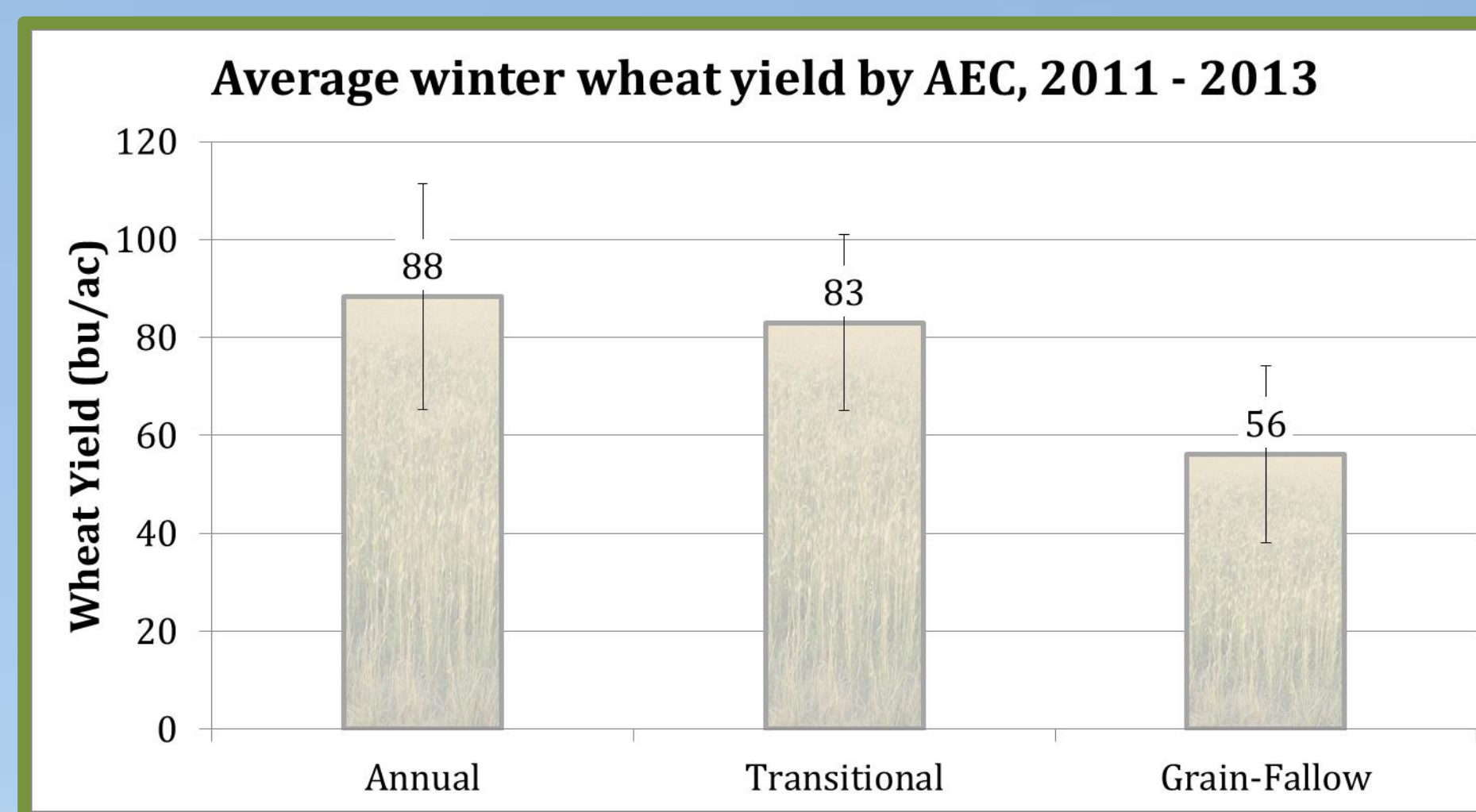
**Fixed costs** are incurred regardless of production levels. These include depreciation, interest, insurance, licenses, and housing.

Hilary (Donlon) Davis<sup>1</sup>, Kathleen Painter<sup>1</sup>, Dennis Roe<sup>2</sup>

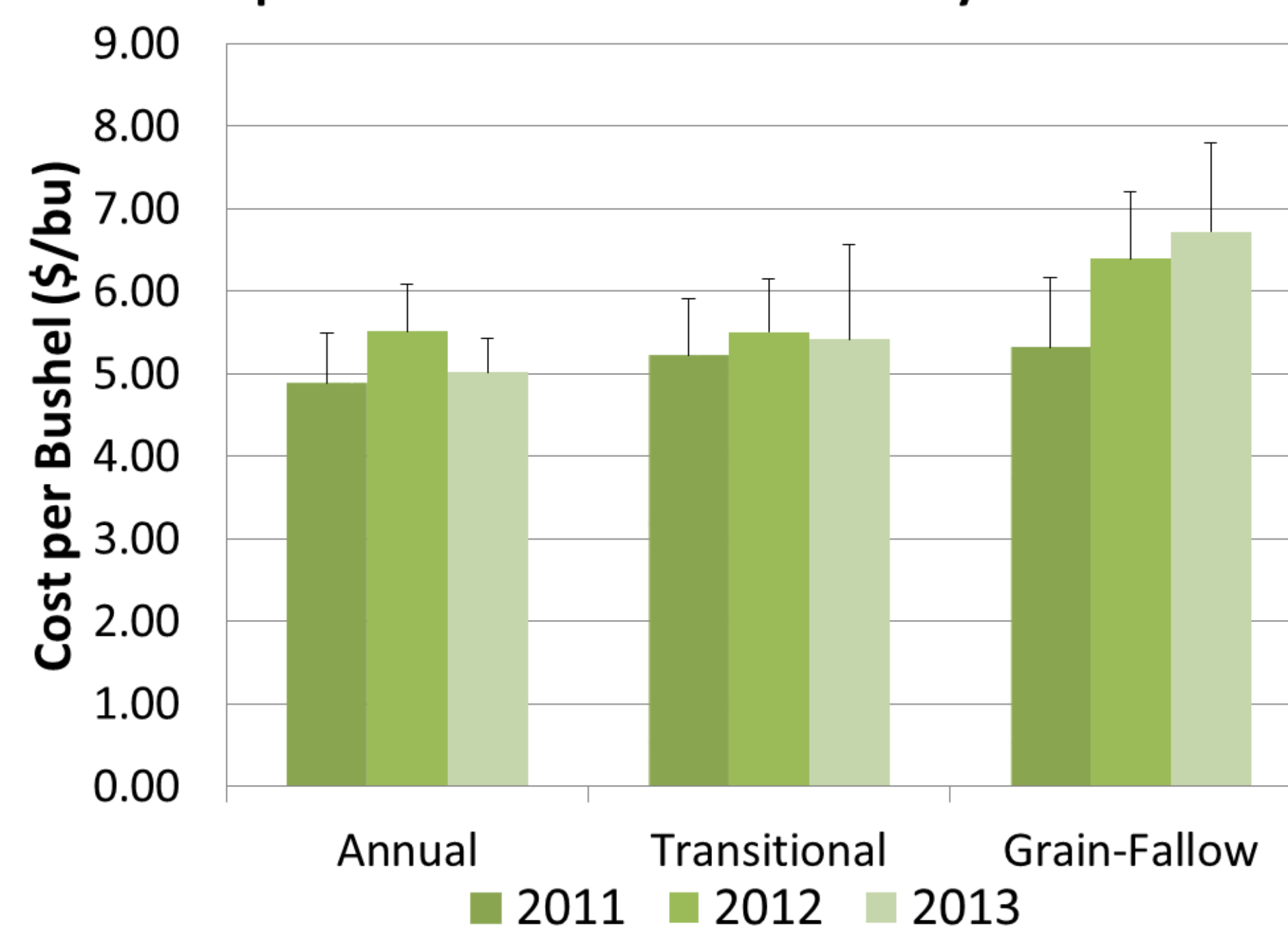
<sup>1</sup>University of Idaho

<sup>2</sup>Washington State University

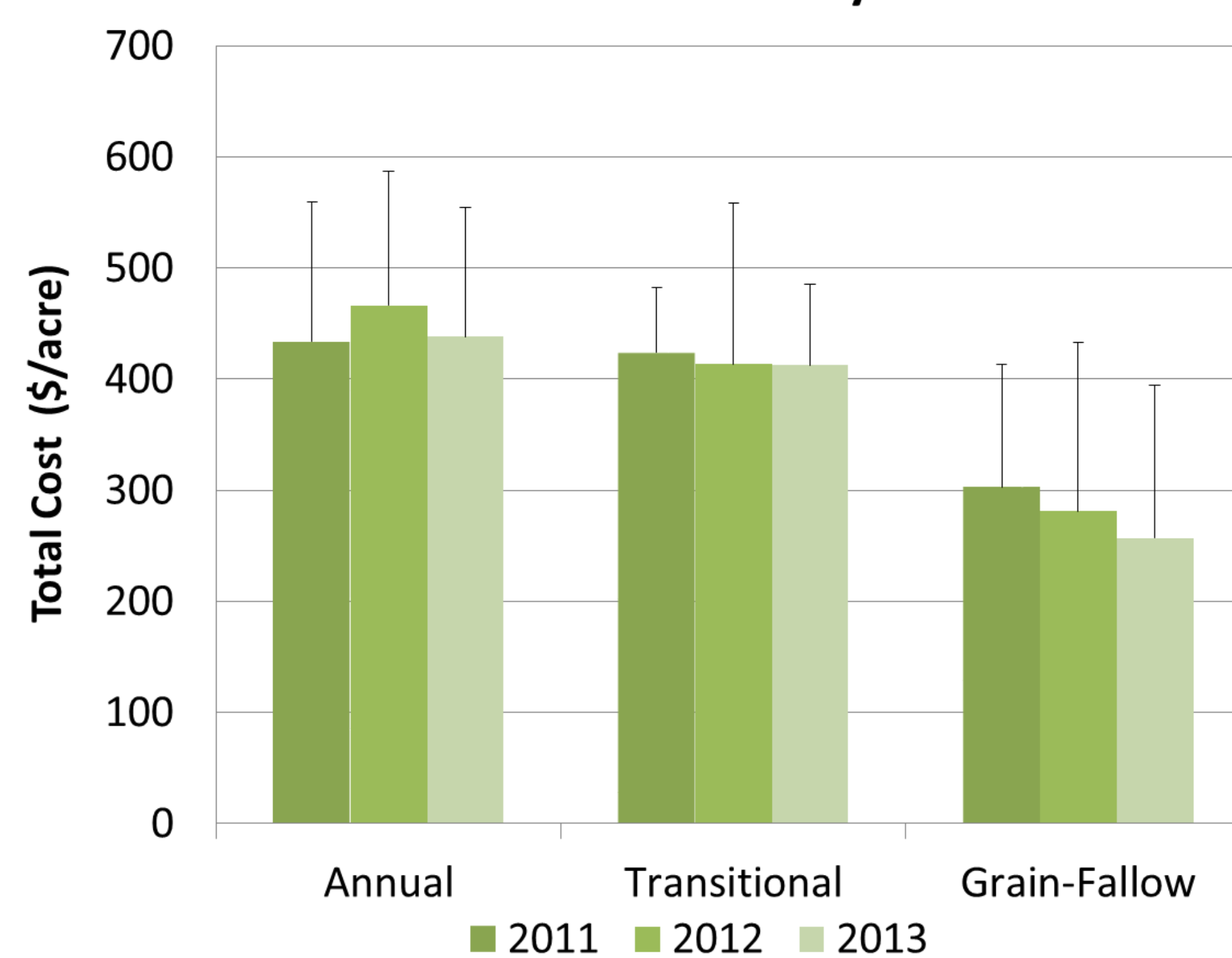
## Survey Results:



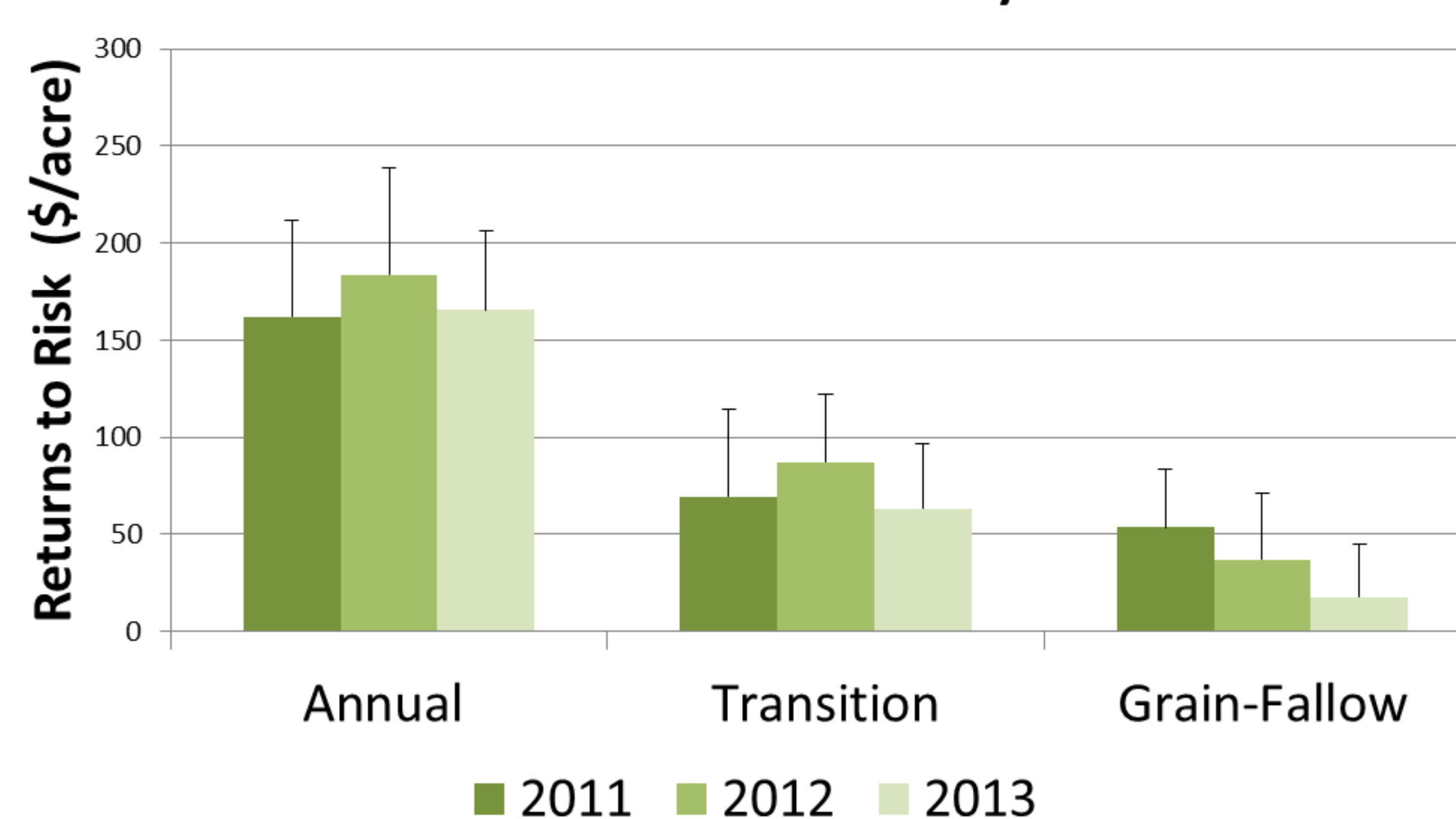
### Costs per Bushel for Winter Wheat by AEC and Year



### Total Production Costs by AEC and Year



### Net Returns for Wheat Production by AEC and Year



## Typical Costs & Operations by AEC:

Machinery Costs for Winter Wheat (\$/acre) for Annual AEC						
Equipment	Repairs	Fuel/Lubricants	Labor	Total Variable Costs	Ownership Costs	Total Cost
250HP Tractor w/ 90' Pull Sprayer	\$2.24	\$0.90	\$0.43	\$3.57	\$1.48	\$5.05
450HP Track Tractor w/ 30' NT Drill	\$1.28	\$5.79	\$1.54	\$8.61	\$10.61	\$19.22
450HP Track Tractor w/ Bankout Wagon	\$0.45	\$2.95	\$0.78	\$4.18	\$3.18	\$7.36
450HP Track Tractor w/ 40' Heavy Harrow	\$0.76	\$2.98	\$0.79	\$4.53	\$3.88	\$8.41
450HP Track Tractor w/ 40' Ripper Shooter	\$0.30	\$3.58	\$0.95	\$4.83	\$3.15	\$7.98
Combine, 30' Header	\$4.16	\$4.20	\$2.40	\$10.75	\$14.64	\$25.40
ATV	\$0.04	\$0.28	\$0.77	\$1.09	\$0.34	\$1.44
2-Ton Truck	\$0.50	\$0.25	\$0.43	\$1.18	\$1.22	\$2.40
Tractor w/ 40' Grain Trailer	\$0.80	\$1.99	\$3.42	\$6.21	\$3.57	\$9.78
3/4-Ton Pickup	\$0.60	\$1.50	\$2.95	\$5.05	\$1.65	\$6.70
Trap Wagon	\$0.16	\$0.06	\$0.12	\$0.35	\$1.09	\$1.43
Total	\$11.28	\$24.48	\$14.58	\$50.35	\$44.81	\$95.16

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.

Machinery Costs for Winter Wheat (\$/acre) for Transition AEC						
Equipment	Repairs	Fuel/Lubricants	Labor	Total Variable Costs	Ownership Costs	Total Cost
200HP-WT w/ 90' Sprayer	\$0.10	\$0.66	\$0.39	\$1.16	\$0.63	\$1.79
400HP WT w/ 36' NT Drill	\$1.80	\$3.90	\$0.77	\$6.47	\$6.54	\$13.01
400HP WT w/ Bankout Wagon	\$0.94	\$4.91	\$0.97	\$6.82	\$5.42	\$12.24
Combine, 30' header	\$2.95	\$2.94	\$2.40	\$8.29	\$7.27	\$15.56
ATV	\$0.04	\$0.28	\$1.17	\$1.49	\$0.33	\$1.82
50HP-WT w/Bucket	\$0.12	\$0.69	\$1.17	\$1.99	\$0.52	\$2.51
2-Ton Truck	\$0.50	\$0.50	\$0.85	\$1.85	\$0.72	\$2.57
Tractor w/ 40' Grain trailer	\$1.20	\$1.25	\$2.14	\$4.58	\$2.08	\$6.66
400HP WT w/ 26' Mower	\$0.85	\$3.71	\$1.11	\$5.67	\$7.67	\$13.35
3/4 Ton Pickup	\$0.32	\$1.50	\$5.13	\$6.94	\$1.85	\$8.79
Trap Wagon	\$0.16	\$0.12	\$0.21	\$0.50	\$1.05	\$1.55
Total	\$8.98	\$20.46	\$16.31	\$45.76	\$34.09	\$79.84

Note: Farm size is assumed to be 2500 acres for the purposes of machinery cost calculations.

Machinery Costs for Winter Wheat (\$/acre) for Grain-Fallow AEC						
Equipment	Repairs	Fuel/Lubricants	Labor	Total Variable Costs	Ownership Costs	Total Cost
100' Self Propelled Sprayer	\$0.26	\$0.21	\$0.35	\$0.82	\$1.62	\$2.44
300HP Tractor w/ 40' NT Drill	\$1.66	\$4.32	\$1.62	\$7.60	\$4.27	\$11.87
300HP Tractor w/ Bankout Wagon	\$0.50	\$1.56	\$0.88	\$2.94	\$1.64	\$4.58
Combine, 30' header	\$3.37	\$5.27	\$2.81	\$11.45	\$4.43	\$15.88
ATV	\$0.30	\$1.35	\$1.92	\$3.57	\$0.75	\$4.32
50HP Wheel Tractor w/ Bucket	\$0.08	\$0.48	\$0.88	\$1.44	\$0.37	\$1.82
2-Ton Truck	\$0.20	\$0.13	\$0.24	\$0.57	\$0.69	\$1.26
3/4-Ton 4WD Pickup	\$0.30	\$1.35	\$1.92	\$3.57	\$0.75	\$4.32
Tractor w/ 40' Grain Trailer	\$0.80	\$1.30	\$2.40	\$4.50	\$2.13	\$6.63
Trap Wagon	\$0.08	\$0.03	\$0.08	\$0.19	\$0.41	\$0.60
Total	\$7.55	\$16.01	\$13.10	\$36.66	\$17.06	\$53.72

Note: Farm size is assumed to be 5000 acres for the purposes of machinery cost calculations.

Machinery costs are calculated using the University of Idaho Machinery Cost Calculator found at <http://web.cals.uidaho.edu/idaahoagbiz/management-tools/>. Necessary machinery information was entered into the calculator. Data needed included current value, age, annual hours of use, salvage value, repair costs, fuel use, and acres finished per hour.

## Conclusions

Costs per bushel for dryland winter wheat production are highest in the grain-fallow AEC, and revenue must be spread over two years. While per acre costs are lowest for this AEC, lower yields and thus revenue combine to make this region the least profitable.