



OSU Agricultural Economics

OSU Plant & Soil Sciences

Stillwater, OK, Oct. 8, 2025



Objective

Estimate the contribution of Oklahoma's wheat variety breeding program on returns to wheat production.

We use publicly available data from 2007 to 2023.
Regional focus, agricultural statistical districts.





Oklahoma
State
University
wheat
breeding
program

- Operated continuously since 1940s
- Origin 1920s, farmer-breeder Joseph Danne, 'Triumph' germplasm
- Financing (**23/24 annual expense: \$527,055, 2023 dollars**):
 - State's checkoff program
 - Seed-based royalties
 - State experiment station formula funding → personnel, infrastructure
 - 1980s endowment, wheat industry investments

Previous return on investment studies, public crop breeding programs



Rice, **20:1** return on investment (ROI)



Small grains, annual net returns, **\$4.2**



Beans, annual net returns, **\$2 million**



Wheat, **19.5:1** ROI



Wheat, **1.75:1** ROI



Wheat, **???**

Data: 2007 to 2023



United States Department of Agriculture
National Agricultural Statistics Service

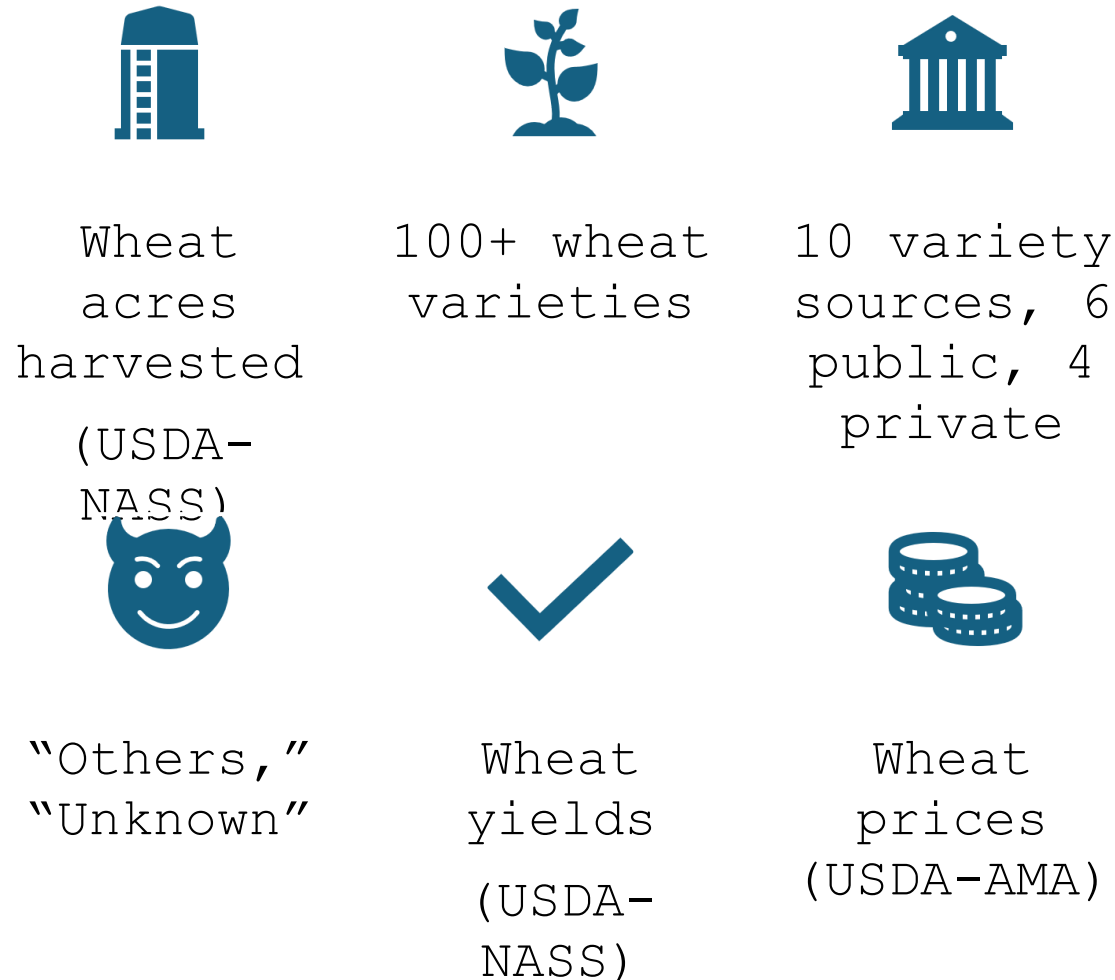


Oklahoma Wheat Variety Report

Oklahoma Field Office · P.O. Box 528804, Oklahoma City, OK · (405) 415-8850 · nassrfsopr@usda.gov
Cooperating with the Oklahoma Department of Agriculture, Food and Forestry and Texas Department of Agriculture

Doublestop CL Plus Remains the Top Wheat Variety Planted in 2023

Doublestop CL Plus is the number one wheat variety planted for the 2023 wheat crop in Oklahoma. Smith's Gold takes the second-place spot with a slight increase from 2022. Gallagher holds the third spot in the top three wheat varieties in Oklahoma. Wheat growers were surveyed by the USDA-NASS Oklahoma Field Office as part of the December Agricultural Survey and Crop Acreage and Production Survey. Funding was provided by the Oklahoma Wheat Commission in cooperation with the Department of Plant and Soil Sciences at Oklahoma State University. Survey results are provided in the following tables, with percent of acres planted for the 2023 crop year by variety and broken out by Agricultural Statistics District and Oklahoma Grain Shed. Data provided by Oklahoma wheat producers is the foundation of this report. The Oklahoma Field Office sincerely thanks all producers who cooperated in this important survey.



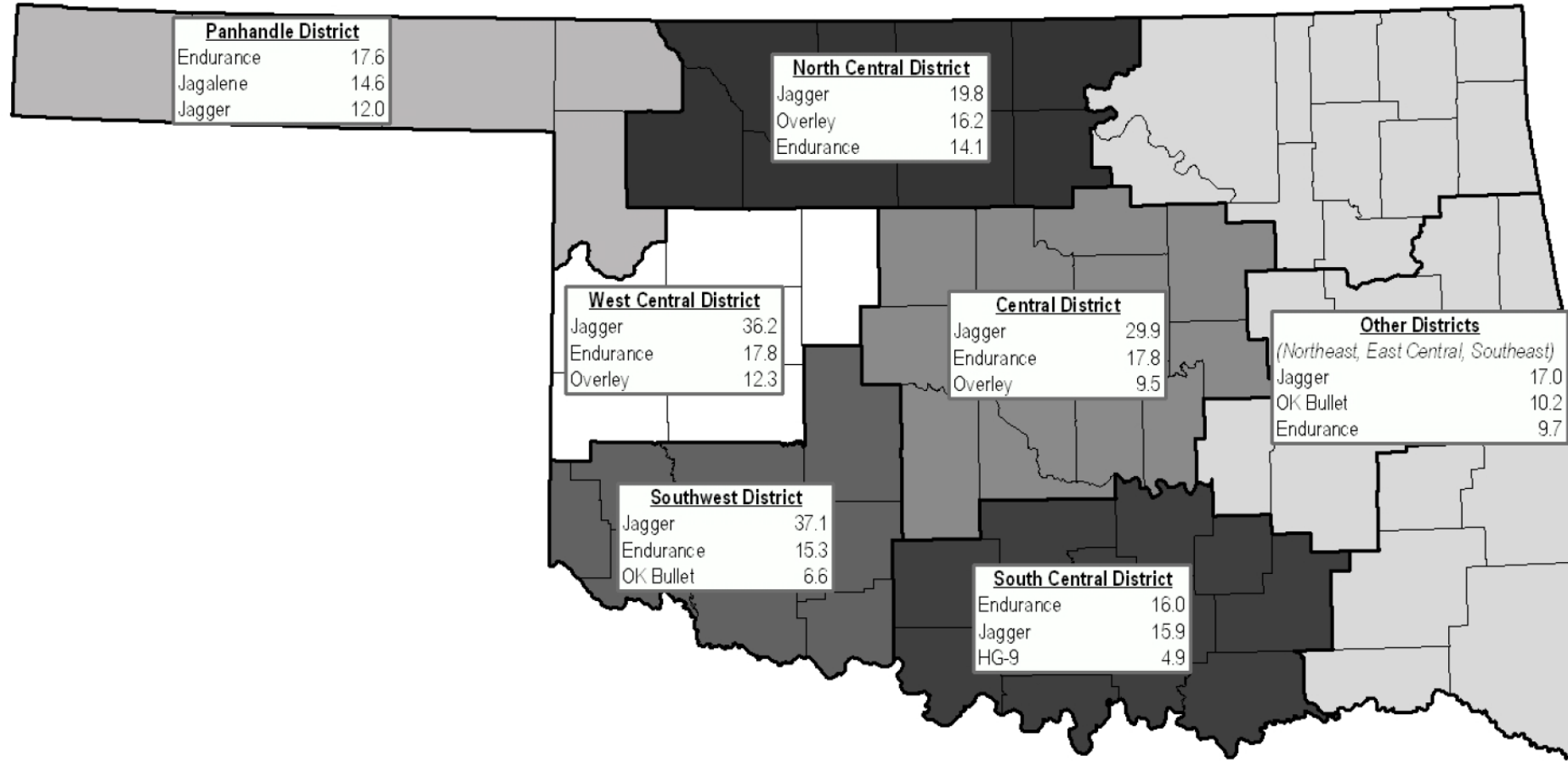
Wheat Varieties: Percentage of Seeded Acres, Oklahoma, 2019-2023

Variety	2019	2020	2021	2022	2023	Variety	2019	2020	2021	2022	2023
percent						percent					
Hard Winter						Hard Winter (continued)					
Doublestop CL Plus	4.8	7.5	8.3	9.0	8.5	Strad CL Plus	-	-	-	-	0.6
Smith's Gold	1.1	8.4	9.2	6.2	8.4	TAM W-101/TAM 101	-	-	-	-	0.6
Gallagher	19.8	15.5	10.9	8.4	7.3	WB 4401	-	-	-	0.3	0.5
Green Hammer	-	0.2	2.8	7.9	5.3	Centerfield	-	-	-	-	0.5
Winterhawk	2.7	1.9	3.0	0.8	2.1	Duster	-	-	-	-	0.5
Showdown	-	-	*	0.4	2.1	Uncharted	-	-	-	-	0.5
Endurance	2.3	2.6	1.6	2.3	2.1	TAM 111	0.7	0.9	0.4	0.2	0.4
SY Monument	1.9	2.8	2.3	1.5	2.1	Deliver	-	-	-	-	0.4
OK Corral	-	-	0.9	2.9	1.6	LCS Helix AX	-	-	-	-	0.4
WB 4515	1.3	2.8	2.4	1.5	1.5	WB 4269	-	-	-	-	0.4
WB 4699	-	-	0.2	0.4	1.2	Garrison	-	-	-	-	0.4
LCS Atomic AX	-	-	*	0.2	1.2	Doans	1.2	1.1	0.7	0.5	0.3
SY Rugged	0.3	0.5	0.9	0.9	1.1	Ruby Lee	1.2	1.5	0.5	0.2	0.3
TAM 112	0.9	0.8	1.7	0.7	1.1	WB Grainfield	1.4	0.6	1.6	0.6	0.3
Jagger	2.1	1.5	0.4	0.6	1.0	LCS Photon	-	-	0.4	0.8	0.3
Bentley	4.4	3.4	2.1	1.5	0.9	Baker's Ann	-	*	0.4	0.6	0.2
TAM 105	-	-	-	-	0.9	Other Hard Winter ¹	15.8	14.6	21.9	11.1	5.3
Iba	3.5	2.5	3.1	1.9	0.9	Unknown Hard ²	29.2	26.3	18.7	30.3	20.3
Big Max	1.1	1.7	1.5	1.4	0.9	Total Hard	97.1	98.7	98.6	95.8	85.3
Everest	0.9	0.4	0.7	0.3	0.8	Total Soft Winter	1.4	0.4	0.9	1.7	1.1
Butler's Gold	-	-	-	-	0.7	Unknown³	1.5	0.9	0.5	2.5	13.6
Bob Dole	0.2	0.4	1.2	1.4	0.7						
WB 4303	0.3	0.8	0.8	1.0	0.7						

¹ Includes varieties with less than 0.2 percent of total acres, or that are suppressed to avoid disclosure of individual reports. ² Includes spring varieties.

³ Unknown contains unspecified varieties that were included to account for acreage. (*) Less than 0.2 percent. (-) No reports

Regions (6 Ag. Statistical Districts)



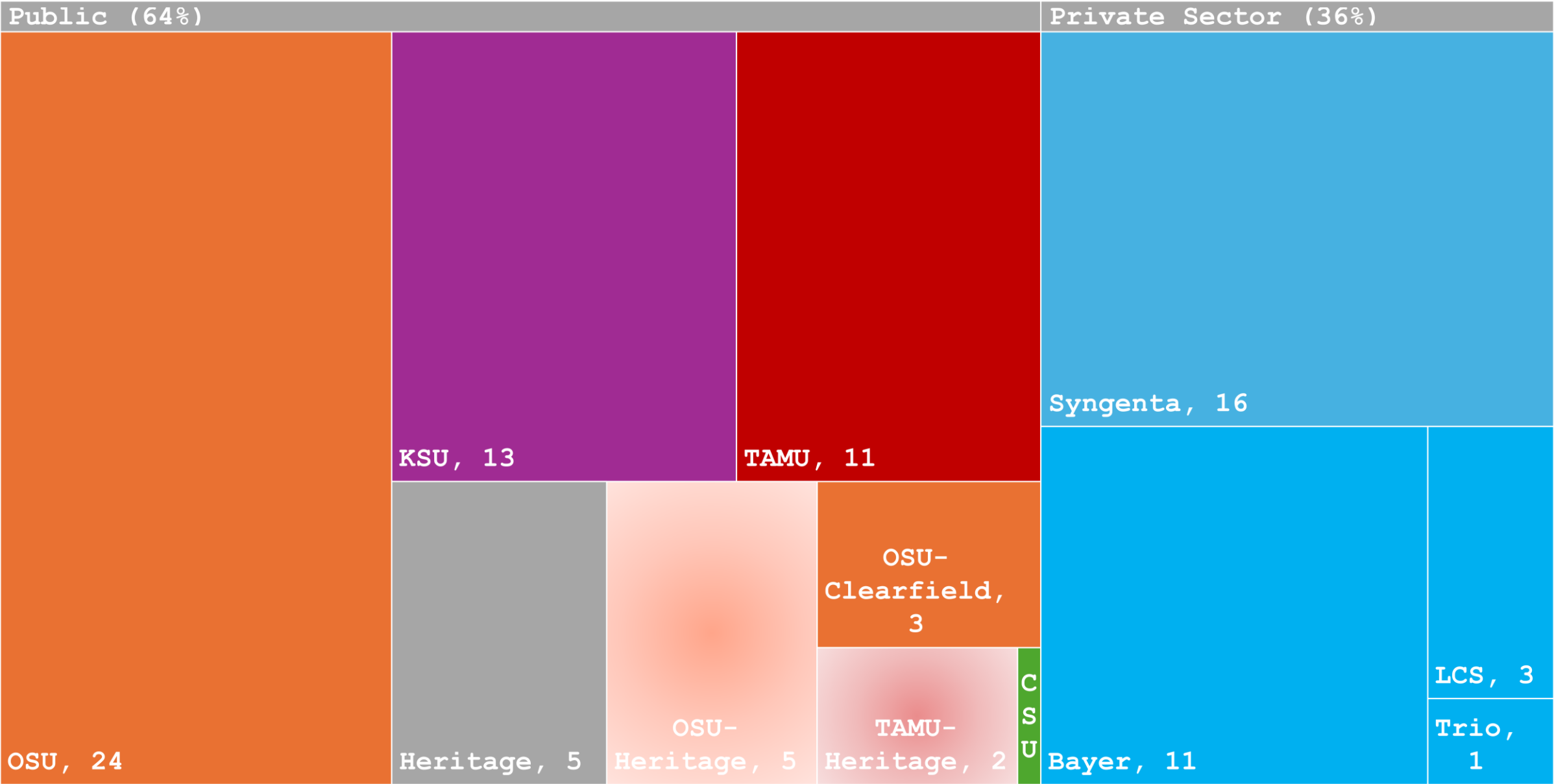
Oklahoma wheat variety data, 2007 to 2023

VARIABLE	AVERAGE	MIN	MAX
Wheat yield (bushel/acre)	32	14	49
OSU wheat varieties (%)	27	0	58
OSU-Clearfield wheat variety (%)	2.3	0	17
Other wheat varieties (%)	26	0	83
Marketing year price (\$/bushel)	5.86	3.44	8.92
Wheat acres planted (100,000s)	7.13	0.46	17.50
Wheat acres harvested (100,000s)	4.62	0.13	14.62

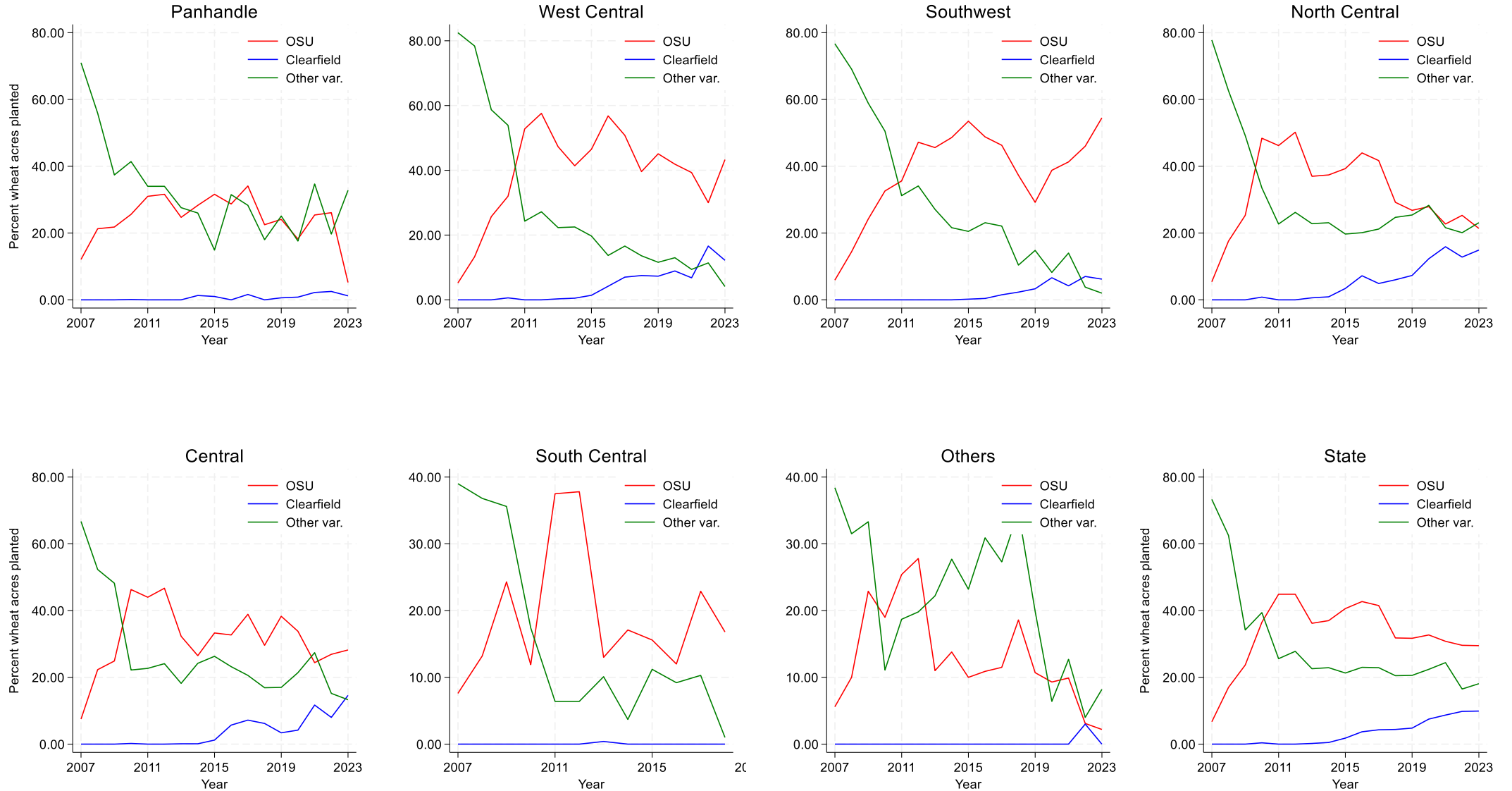
Source: USDA-NASS Quick Stats, USDA-AMA.

Source (#)	Wheat Varieties Planted in Oklahoma, 2007 to 2023
OSU (23)	Chislom, Custer, Deliver, Duster, Endurance, Gallagher, Garrison, GreenHammer, Iba, Intrada, OK101, OK102, OKBullet, OKCorral, RubyLee, 2174, Bentley, BakerAnn, ButlerGold, Showdown, SmithGold, ██████████, Uncharted
OSU-Clearfield (4)	Centerfield, DoublestopCL, Okfield, StradCLPlus
KSU (11)	LCSChrome, 1863, 2137, 2157, 2158, Bob Dole, Everest, Jagger, Karl-92, Overlay, Zenda
TAMU (15)	Lockett, TAM101, TAM105, TAM107, TAM110, TAM111, TAM112, TAM113, TAM114, TAM115, TAM200, TAM203, TAM204, TAM401, TAMW101
CSU (3)	LCSMint, Prairie Red, AP503CL2
Heritage (14)	BigMax, Chisholm, Custer, ElevatorRun, JEI110, OK101, OK102, Scout, TAM101, TAM105, TAM107, TAMW101, Triumph64, HG9
Syngenta (19)	CJ, Coronado, Cuttre, Dumas, Doans, Fannin, Fuller, Greer, Jackpot, Jagalene, Longhorn, Ogallala, Post Rock, SYFlint, SYLlano, SYMonument, SYRazor, SYRugged
Bayer (13)	Armour, SantaFe, Shocker, WB4269, WB4303, WB4401, WB4458, WB4515, WBCedar, WB4699, WBGrainfield, WBRedhawk, Winterhawk
Limagrain Cereal Seeds (5)	LCSAtomicAX, LCSFusion, LCSHelixAX, LCSWizard, LCSPhoton
Trio (1)	T158

Oklahoma planted wheat varieties: 2007 to 2023



OSU wheat variety adoption



Impacts

OSU wheat varieties 2007 to 2023

Wheat yield:

1% increase, acres planted → 0.78
bu./ac. increase

Yield variability:

1% increase, acres planted → 9%
decrease

Returns from OSU wheat breeding program 2007 to 2023 (2023 dollars)

For Oklahoma...

Average annual returns: \$4.6 million

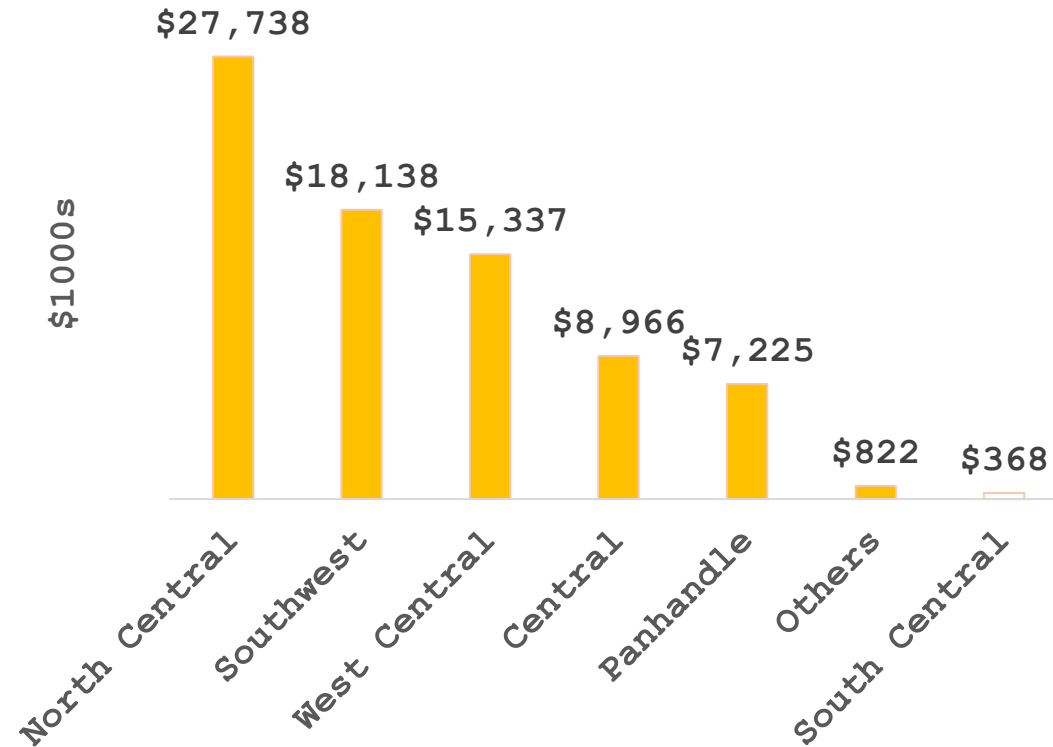
Total returns: \$78.6 million

Unadjusted estimate...

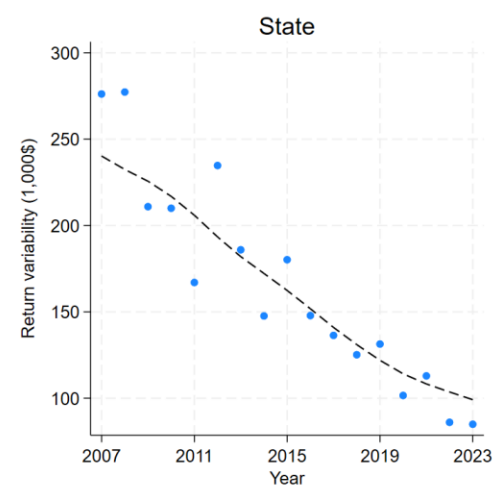
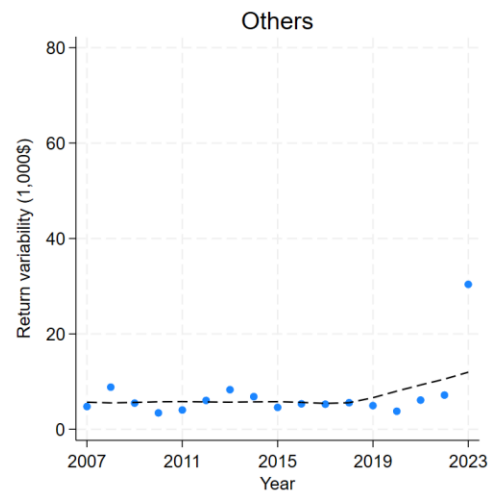
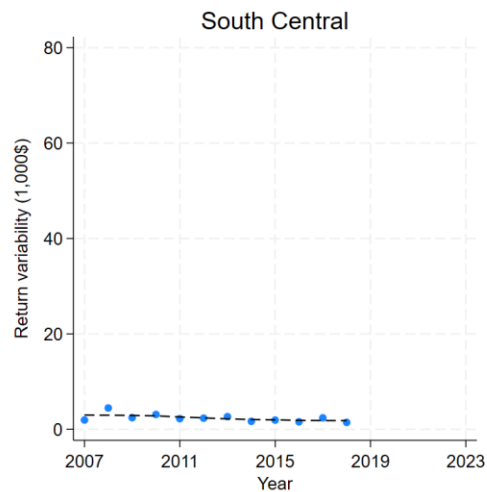
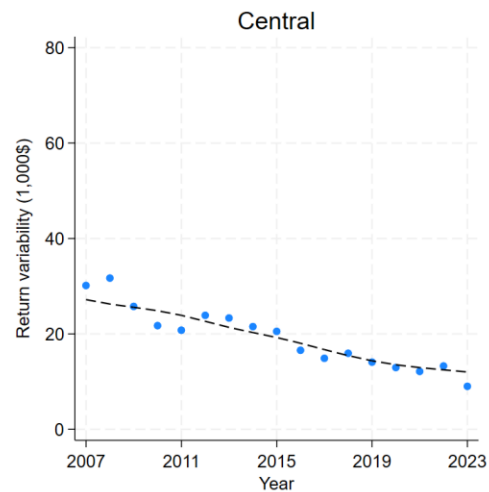
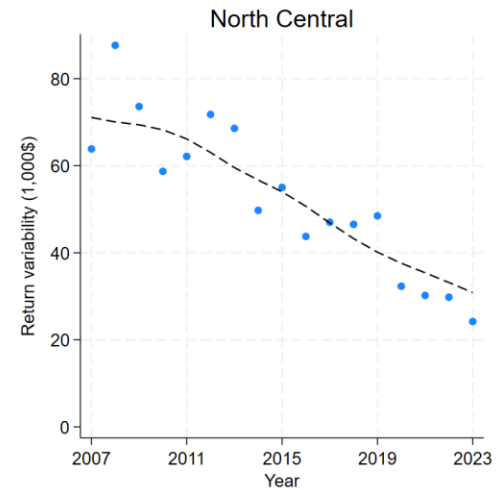
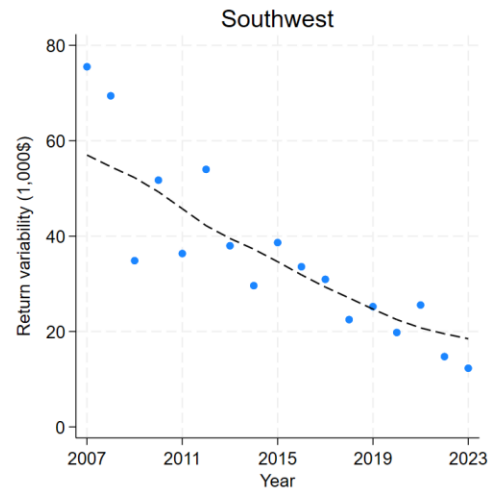
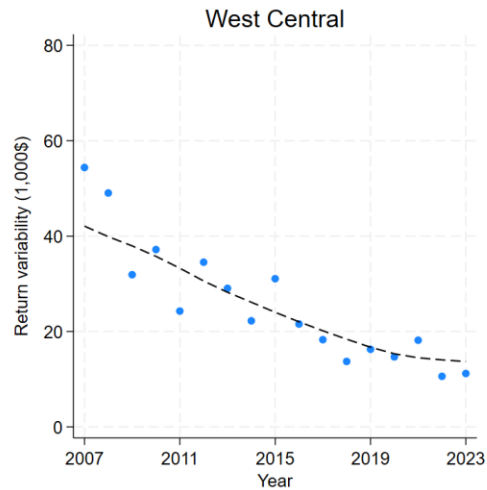
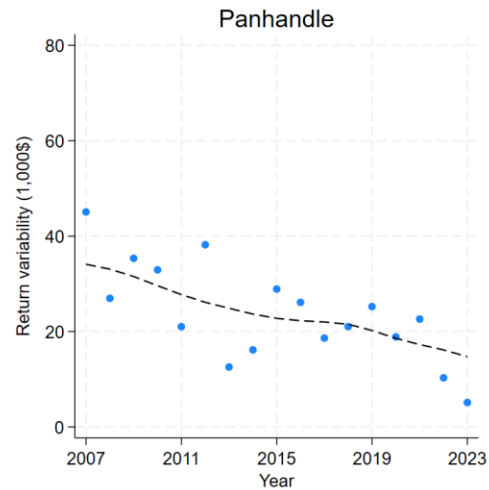
- **Doesn't include** licensing royalties, protein premium, baking quality, and other downstream effects on the economy.
- **Percent acres planted** to OSU varieties **understated** ("others," "unknown" categories)
- No **cost of production**

Regional returns (2023 dollars)

Total returns, 2007 to 2023



Return variability, 2007 to 2023 (2023 dollars)



Return on investment

- Average annual return: **\$4.6 million**
- Wheat breeding program annual expense: **\$527,055**

→ Return on investment: **8.76 to 1**

- Above is a **direct effect**; excludes economy-wide impacts.
- **Leaves out** licensing royalties, protein premium, or baking quality.
- OSU variety acreage **understated** ("others," "unknown" categories)
- Doesn't consider wheat **production costs**.

Impact on Oklahoma's other economic sectors?

Direct program impact → *indirect effects* on other sectors

Wheat value chain: ag. inputs, real estate, banking, milling, beef, hauling, trucking, storage...

Impact on Jobs, Total Industry Output (\$), Value Added (\$)

Value Added = Total Industry Output - ***Cost of doing Business***

Annual impact on the Oklahoma economy (\$1000s, 2023 dollars)

Top 9 Sectors	Change in:		
	Total Industr y output	Value Added	Employment
Grain farming	\$4,619	\$27	23
Finance, Lending, Insurance, Real Estate	\$1,175	\$636	4
Services	\$797	\$451	7
Ag. Inputs	\$729	\$280	4
Wholesale trade	\$393	\$271	2
Construction	\$121	\$50	1
Retail trade	\$112	\$67	1
Truck transportation	\$87	\$42	1
Beef cattle ranching/farming (includes dual-purpose), feedlots	\$29	\$10	1

Annual impact on Oklahoma's economy

>> **\$4.6 million**, wheat breeding program
direct impact

Total Jobs: **46**

Total Industry Output: **\$8.8**

million

Cost of doing Business: **-\$6.6**

million

Value Added: **\$2.2 million**

Economic ROI @ Value Added: **3.1 to 1**

Conclusions

- Returns to OSU wheat breeding program substantial, but impact varies by production region
- 2010; OSU varieties captured share of planted wheat acres
- Modest long-term impacts on yield
- **Decreased yield and return variability**
- Significant knock-on effects, supporting economic sectors
- Limitations, caveats:
 - OSU variety uptake is understated → conservative estimates
 - Economic ROI reflects income and productivity impacts on the economy, ***not financial***



Thank you.

Questions?