

# Managing wheat for grain protein



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TEXAS A&M  
**AGRI**LIFE  
EXTENSION

*West Region Virtual Wheat Tour – May 7, 2020*

# Influences on Grain Protein

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- ▣ Variety
- ▣ Moisture
- ▣ Temperature
- ▣ Nitrogen Rate
- ▣ Nitrogen Timing
- ▣ Higher yields generally result in lower protein
  - A.K.A. 'Dilution effect'

# Protein Premiums

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- ▣ 11% protein considered normal
  - Premiums generally start somewhere between 11% & 12% protein
  
- ▣ Range dramatically from year to year
  - From \$0/bu (2015) to \$1.65/bu (2017)
  - Average \$0.68/bu for >12% protein over last 6 years
  
- ▣ Currently running \$0.10 per 1% change in protein

# Variety impact on protein

- ⊙ In a constant environment, there are differences in protein between varieties.
- ⊙ High yielding environments may result in reduced protein, but these tradeoffs are not genetic.
- ⊙ **High yielding variety ≠ low protein**
- ⊙ Refer to variety trial reports

# Variety impact on protein

## Brady 2019

- ⊙ **Green Hammer** (14.4%, 29 bu/ac)
- ⊙ **Smith's Gold**
- ⊙ **Weathermaster** (13.7%, 17 bu/ac)
- ⊙ **CP7869**
- ⊙ **Gallagher**
- ⊙ **WB4418**
- ⊙ **TAM 205**

2019 Uniform Wheat Variety Trial: Brady, TX

Rank <sup>†</sup>	Variety	Source	Yield (bu/a)			Test Wt (lb/bu)	Protein (%)
			3-Year <sup>‡</sup>	2-Year	2019	2019	2019
1	TAM 114	Adaptive Genetics	40.8	35.1	28.9	55.5	12.2
2	Gallagher	OSU	38.9	32.8	26.2	54.0	13.5
3	Bentley	OSU	35.8	26.1	29.7	53.8	12.6
4	SY Grit	Syngenta	35.7	23.7	26.8	52.9	13.2
5	SY Razor**	Syngenta	34.3	22.7	18.2	55.3	12.6
6	WB Cedar	Westbred	34.1	28.7	26.2	53.2	12.6
7	TAM 304	Scott Seed	33.6	29.3	29.1	50.4	13.2
8	Greer	Syngenta	32.4	21.9	25.0	53.7	12.7
9	SY Drifter	Syngenta	31.5	23.9	26.9	55.7	13.3
10	TAM W-101	TAMU	25.9	22.2	21.1	53.6	13.2
11	TAM 204**	Watley Seed	25.4	17.5	11.9	48.6	13.1
12	Weathermaster 135**	Unknown	21.8	17.4	16.7	49.8	13.7
13	LCS Chrome	Limagrain	34.1	24.1	24.1	52.0	13.0
14	WB4269	Westbred	28.9	25.1	25.1	52.9	12.4
15	TAM 115 (TX11A001295)	TAMU	27.5	24.6	24.6	56.4	13.3
16	SY Rugged	Syngenta	25.0	25.3	25.3	53.7	12.6
17	SY Flint	Syngenta	24.2	19.3	19.3	55.3	11.5
18	WB4721	Westbred	23.8	18.3	18.3	53.7	12.7
19	Long Branch	Dyna Gro	20.7	17.4	17.4	50.2	12.8
20	WB4515	Westbred	20.0	19.6	19.6	54.9	12.4
21	WB4699	Westbred	34.1	34.1	34.1	53.3	11.7
22	Bob Dole	Syngenta	32.6	32.6	32.6	54.6	13.0
23	WB4792	Westbred	29.3	29.3	29.3	58.8	13.0
24	Green Hammer (OK13209)	OSU	28.6	28.6	28.6	57.3	14.4
25	TAM 205 (TX12V7415)	TAMU	28.2	28.2	28.2	56.6	13.4
26	WB4418	Westbred	28.1	28.1	28.1	54.4	13.4
27	Showdown (OK12716)	OSU	25.2	25.2	25.2	50.9	12.0
28	Smith's Gold	OSU	24.0	24.0	24.0	55.1	13.9
29	CP7010 (CPX79-10)	Croplan	23.3	23.3	23.3	57.3	12.2
30	Skydance (OK13625)	OSU	22.5	22.5	22.5	57.9	12.9
31	CP7909	Croplan	20.3	20.3	20.3	51.5	12.7
32	CP7869	Croplan	19.0	19.0	19.0	52.8	13.6
<b>LSD (0.05)</b>			<b>3.2</b>	<b>4.3</b>	<b>4.6</b>	<b>1.8</b>	<b>0.6</b>
<b>CV (%)</b>			<b>10.4</b>	<b>14.9</b>	<b>11.6</b>	<b>2.1</b>	<b>3.1</b>
<b>Mean</b>			<b>32.5</b>	<b>25.3</b>	<b>24.2</b>	<b>53.9</b>	<b>12.9</b>

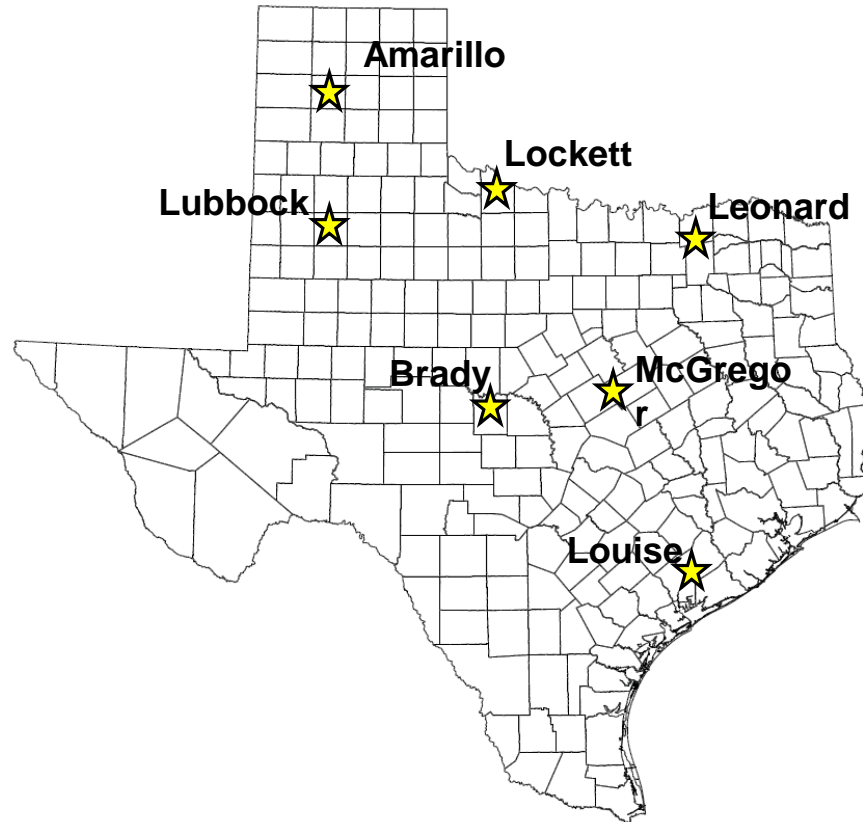
\*\*Awnless variety.

<sup>†</sup>Varieties ranked according to 3-year, 2-year, then 2019 yield averages.

<sup>‡</sup>3-year average based on 2015, 2017 and 2019 data.

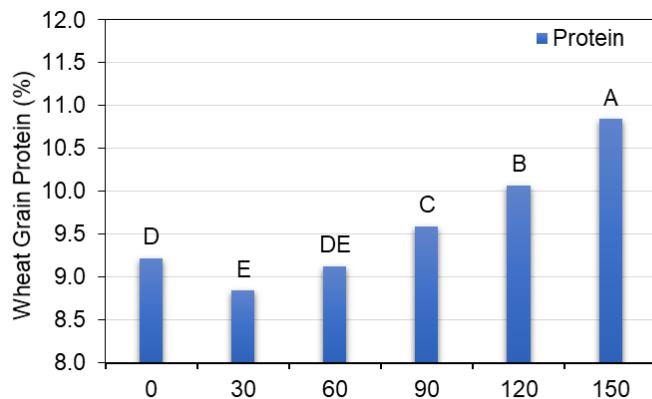
# Statewide N management trial

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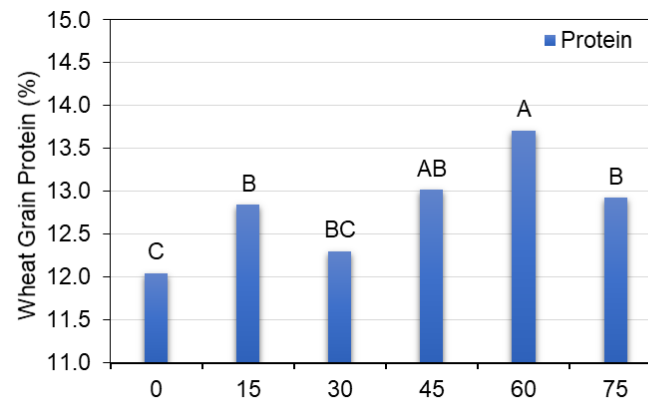


# Grain Protein Results

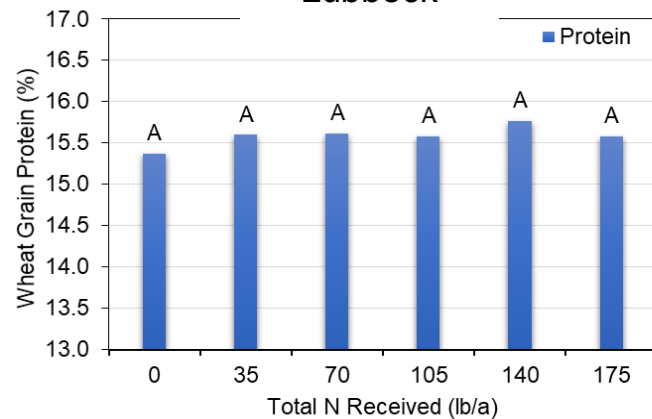
Leonard



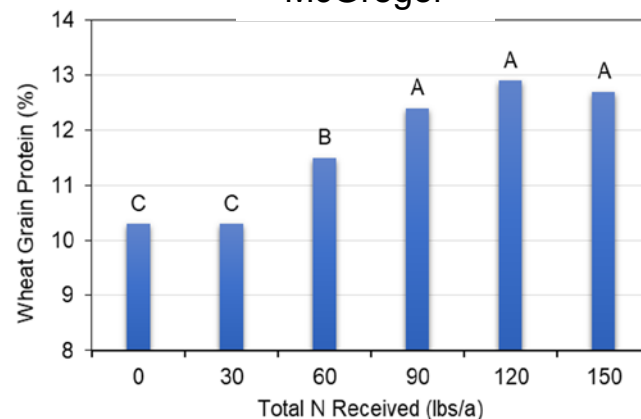
Lockett



Lubbock

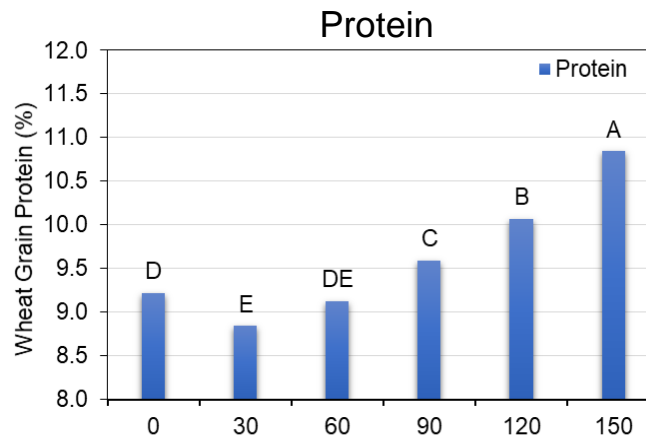
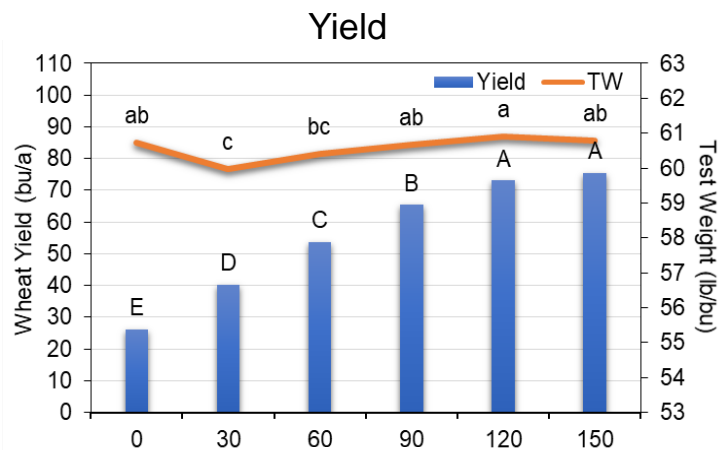


McGregor

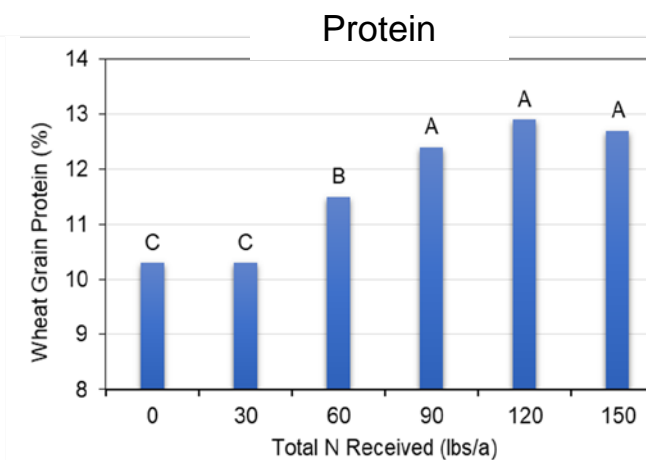
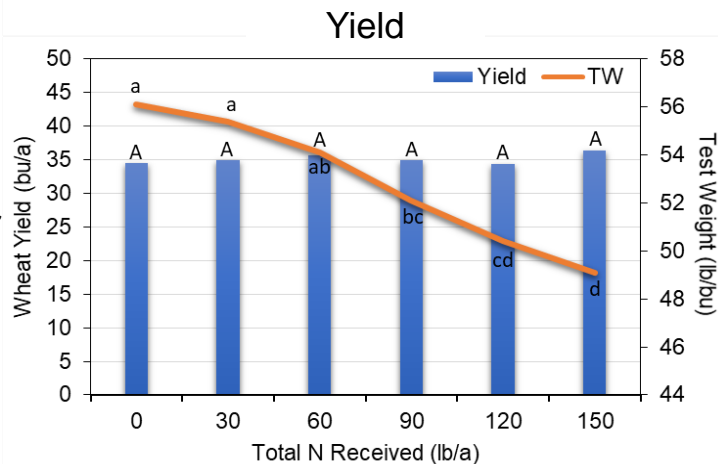


# Yield vs Grain Protein

Leonard



McGregor

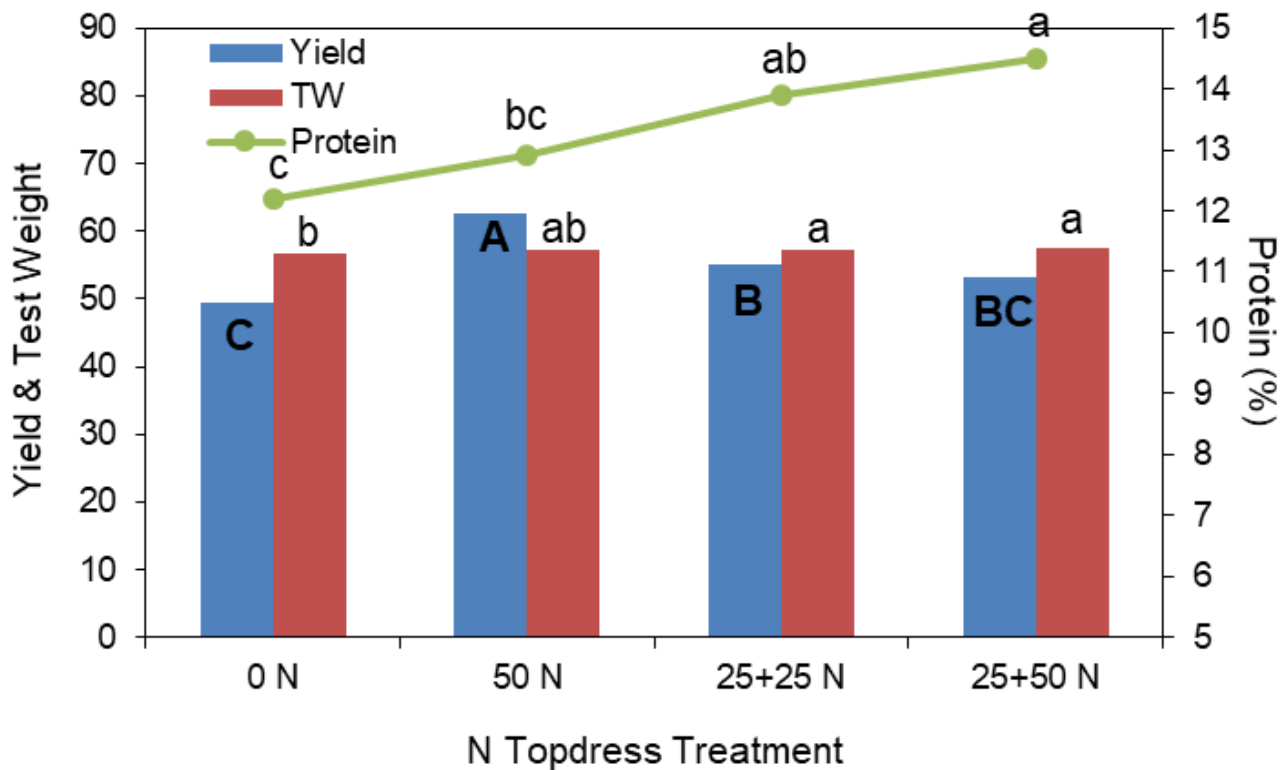




# Nitrogen Timing – Hillsboro 2014

## Treatments

1. Control – 34 lb N October, no topdress
2. Topdress – 50 lb N only
3. Topdress – 25 lb N fb 25 lb N at heading (Apr 24)
4. Topdress – 25 lb N fb 50 lb N at heading (Apr 24)



# Nitrogen Timing – Hillsboro 2014

Treatment	Nitrogen Amount (lb/Acre)	Nitrogen Expense (\$/Acre)	Yield (bu/a)	Yield Revenue (\$/Acre)	Protein (%)	Protein Revenue (\$/Acre)	Net Revenue (\$/Acre)
Control	34	\$11.22	49.5	\$248	12.2	\$5.94	\$243
50 lb topdress	84	\$27.72	62.6	\$313	12.9	\$11.89	\$297
25 lb fb 25 lb	84	\$27.72	55.1	\$276	13.9	\$15.98	\$264
25 lb fb 50 lb	109	\$35.97	53.1	\$266	14.5	\$18.59	\$249

\*Used N price of \$0.33/lb

\*\*Used \$5.00/bu wheat price

\*\*\*Assumed protein premium of \$0.10 per 1% protein increase from 11%

- ▣ Additional N and application costs must be justified by premiums

# Questions?



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