

The VSR Track Record for 2018 Kansas HRW Wheat Futures

KSU Risk & Profit Conference

August 16-17, 2018

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Non-Convergence & VSR Issues

- A. If the market is working perfectly, no one will want to deliver!**
- B. When futures are a dollar higher than cash, *then* farmers would like to deliver wheat – as occurred in 2016. This caused the non-convergence.**

C. Actions by the CME on Kansas HRW Wheat Futures

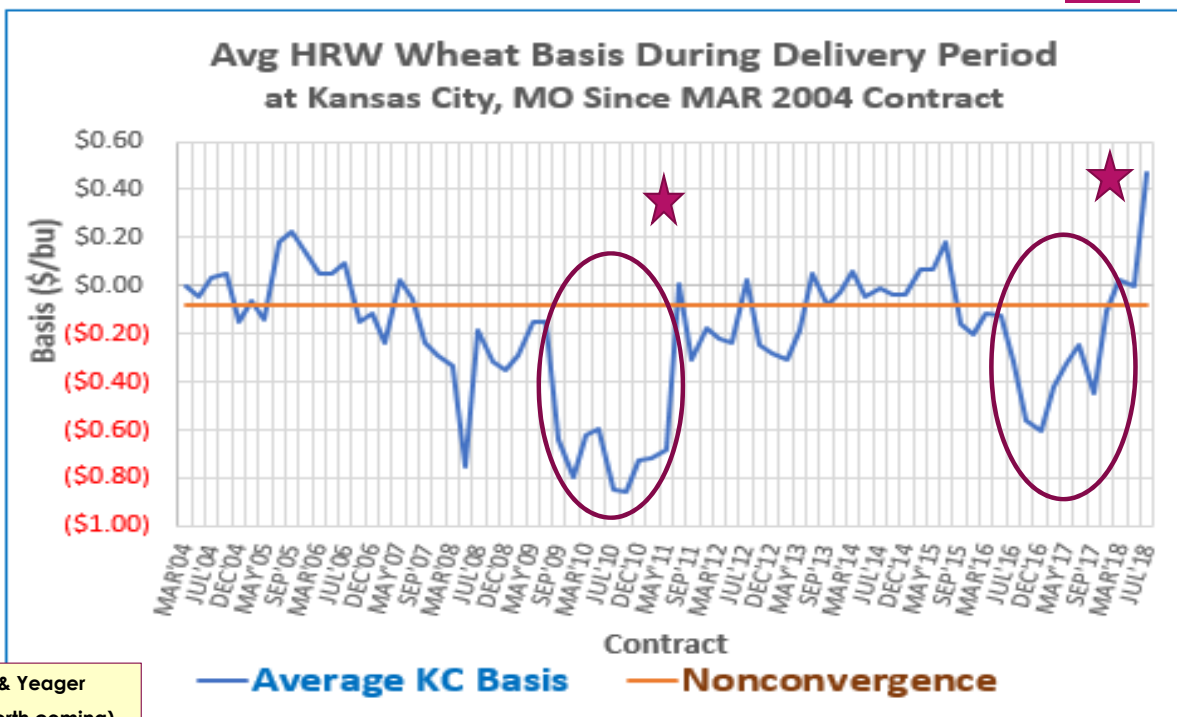
From Fixed Seasonal Storage Rates

⇒ **Variable Storage Rate (VSR)**

From Electronic Warehouse Receipt

⇒ **Shipping Certificates**

→ Changes effective **March 18, 2018** on the **MARCH 2018 Contract**



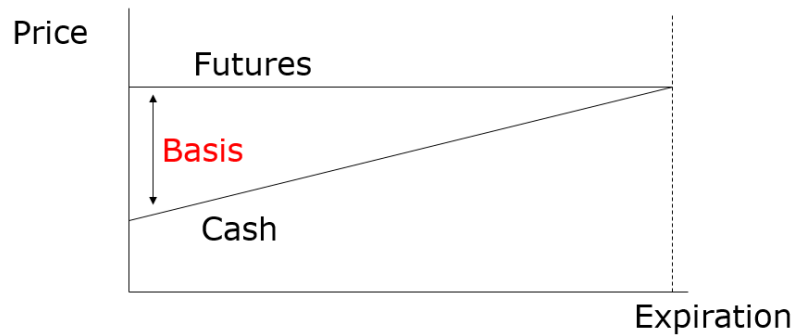
Non-Convergence & VSR Issues

D. VSR has now been applied to Kansas HRW Wheat Futures

- **Key factors in VSR**
 - Daily grain storage rates
 - Interest Rates
 - Daily KS HRW Wheat futures prices & upfront "*spread*"

Convergence of Grain Futures & Cash \$'s

- “**Convergence**” is the market pattern of cash & futures prices tending to “*come together*” at contract expiration
 - Grain basis approaches **zero (\$0.00)** at the delivery market as the futures contract expires



Convergence of Grain Futures & Cash \$'s

- “**Convergence**” is necessary for....
 - Effective futures hedging
 - Efficient discovery of storage returns (i.e., “the carry”)
 - Performance of crop insurance revenue contracts

Actions by the Chicago Mercantile Exchange:

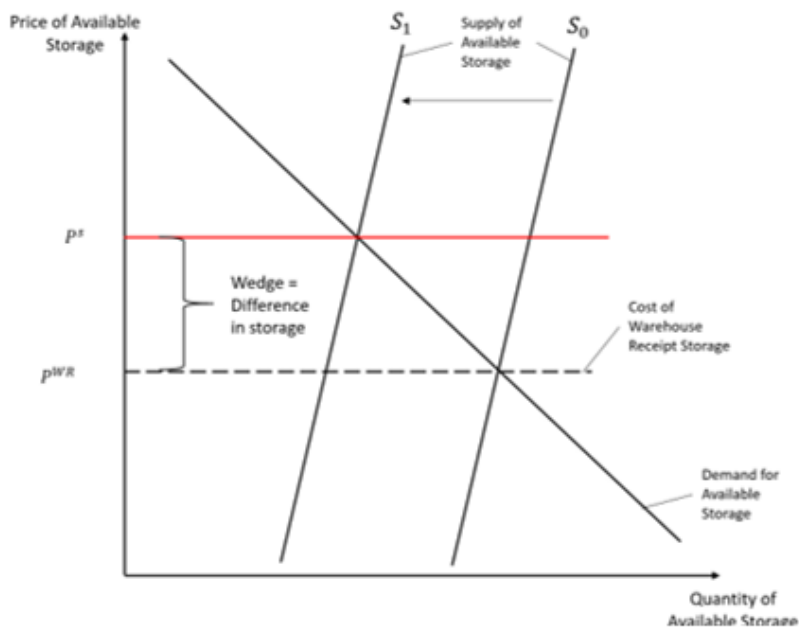
From Fixed Seasonal Storage Rates → Variable Storage Rate (VSR)

From Electronic Warehouse Receipt → Shipping Certificates

→ Changes effective **March 18, 2018** on the **MARCH 2018 Contract**



Wedge Creation from Lack of Available Physical Storage



Minnix & Yeager
2018 (forth coming)

Non-Convergence in a HRW Wheat Hedge

- **Pre-harvest - on February 1st**

JULY HRW futures	=	\$4.00
<u>Expected basis</u>	=	\$0.40 under
Expected net price	=	\$3.60

- **THEN at harvest - on July 1st**

JULY HRW futures	=	\$5.00	(JULY futures up \$1.00 /bu)
Actual basis	=	\$1.00 under	(Basis \$0.60 /bu <u>wider</u> than expected)
<u>Loss on futures</u>	=	\$1.00	
Actual net price	=	\$3.00	(Net price \$0.60 <u>lower</u> than expected)

Non-Convergence in a HRW Wheat Hedge

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<u>Expected basis</u>	=	\$0.40 under
Expected net price	=	\$3.60

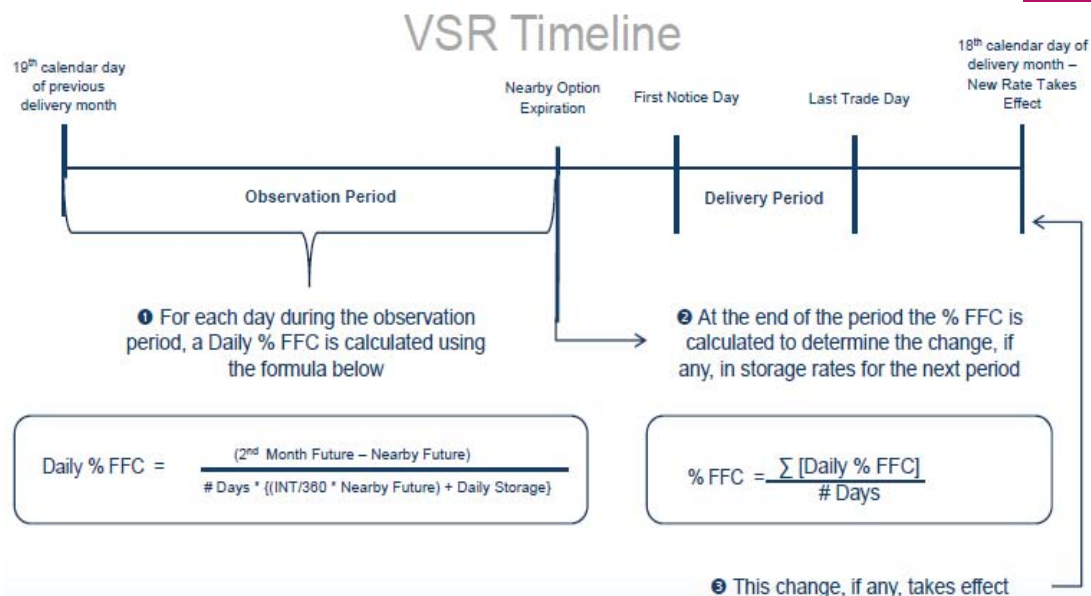
- **THEN at harvest - on July 1st**

JULY HRW futures	=	\$3.50	(JULY futures up \$1.00 /bu)
Actual basis	=	\$1.00 under	(Basis \$0.60 /bu <u>wider</u> than expected)
<u>Gain on futures</u>	=	\$0.50	
Actual net price	=	\$3.00	(Net price \$0.60 <u>lower</u> than expected)

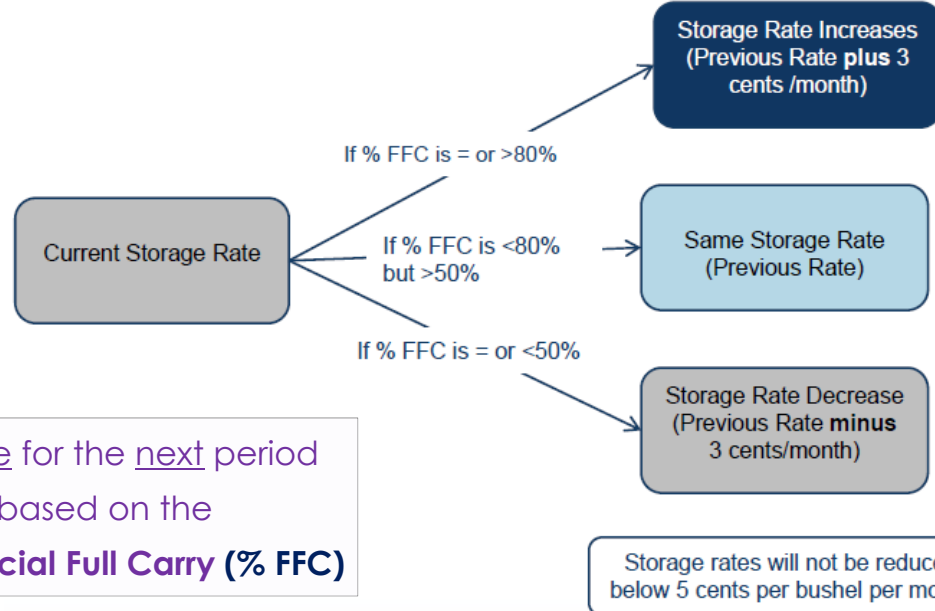
Non-Convergence in a HRW Wheat Hedge

- **Key to understanding non-convergence**
 - Realizing that physical grain is not deliverable by farmers on futures contracts
- **Delivery Instruments used to make/take futures delivery**
 - Only CME approved elevators can create warehouse receipts / shipping certificates
 - ⇒ *Takers of delivery must **pay storage** on these “paper” delivery instruments IF they “hold” rather than “sell” them (i.e., “load out”)*
 - Takers of the delivery will receive a margin call for the full value of the contract (\$5.00 wheat would create a margin call of \$25,000/contract)
- **Non-Convergence** results when the “*value of the delivery instrument*” diverges from the “*value of cash grain*” at the delivery point

VSR Storage Rates – Timeline & Calculation



VSR Adjustments – Based on % Financial Full Carry



The Storage Rate for the next period will be adjusted based on the **percent of Financial Full Carry (% FFC)**

VSR: “Financial Full Carry” (FFC)

Calculating Financial Full Carry (FFC)

⇒ The cost to...

- 1) **Take delivery** of a wheat *shipping certificate*
- 2) **Carry it** to the next *delivery period* - and -
- 3) **Re-deliver it** during the next *delivery period*

Figuring “Financial Full Carry” (FFC)

$$\# \text{ Days} * \left[\left(\frac{\text{Interest}}{360} * \text{Futures Price} \right) + \text{Daily Storage} \right]$$

Where:

Days = Number of calendar days from first delivery day in the nearby contract to first delivery day in the contract following the nearby contract

Interest = 3-Month LIBOR rate + 200 basis points

Futures Price = Settlement price for the nearby contract

Daily Storage = Current daily premium charge

Example: SEPT 2018 HRW Wheat on 6/22/2018

- **64 days** between 1st delivery day for JULY 2018 & SEPT 2018
 - **Daily Storage Rate = \$0.00365 /day** (\approx \$0.11 /month) (*minimum \$*)
 - **3-Month LIBOR rate = 2.3%** \Rightarrow 2.3% + 2.0% base = 4.3% interest
 - **JULY 2018 Futures = \$4.88 $\frac{3}{4}$ /bu**
- **FFC**_{5/21-6/22} = 64 days X [((.043/360) x \$4.88 $\frac{3}{4}$) + \$0.00365/day] = \$0.27 /bu

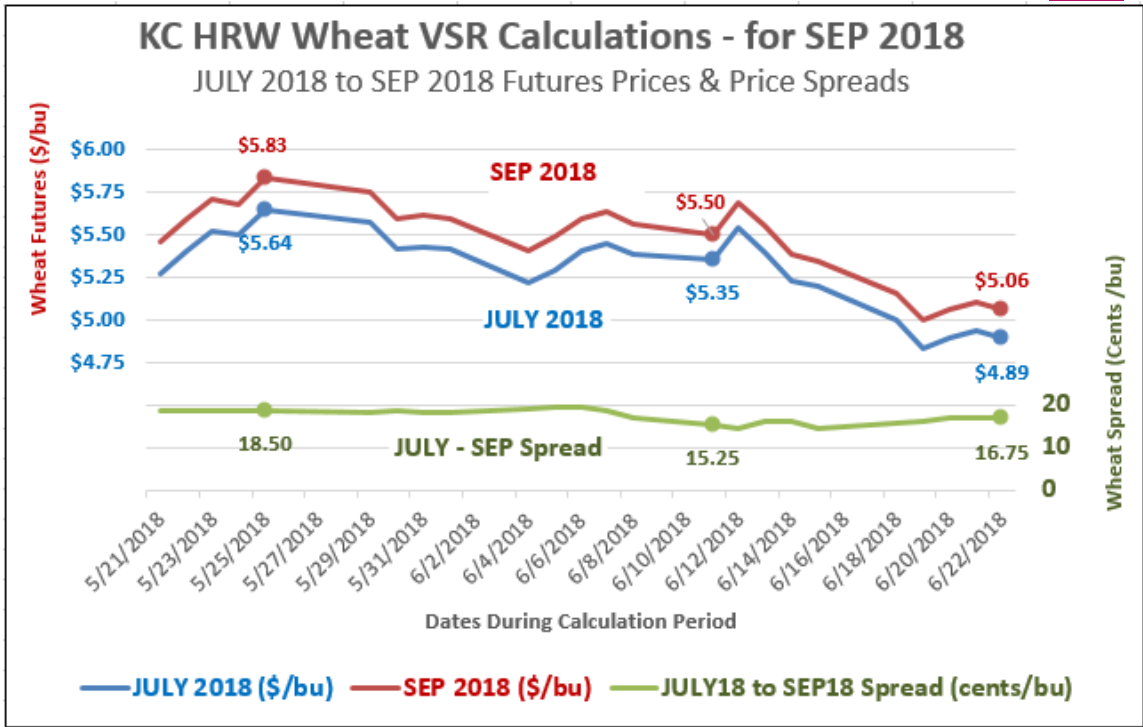
KANSAS CITY HRW WHEAT VSR

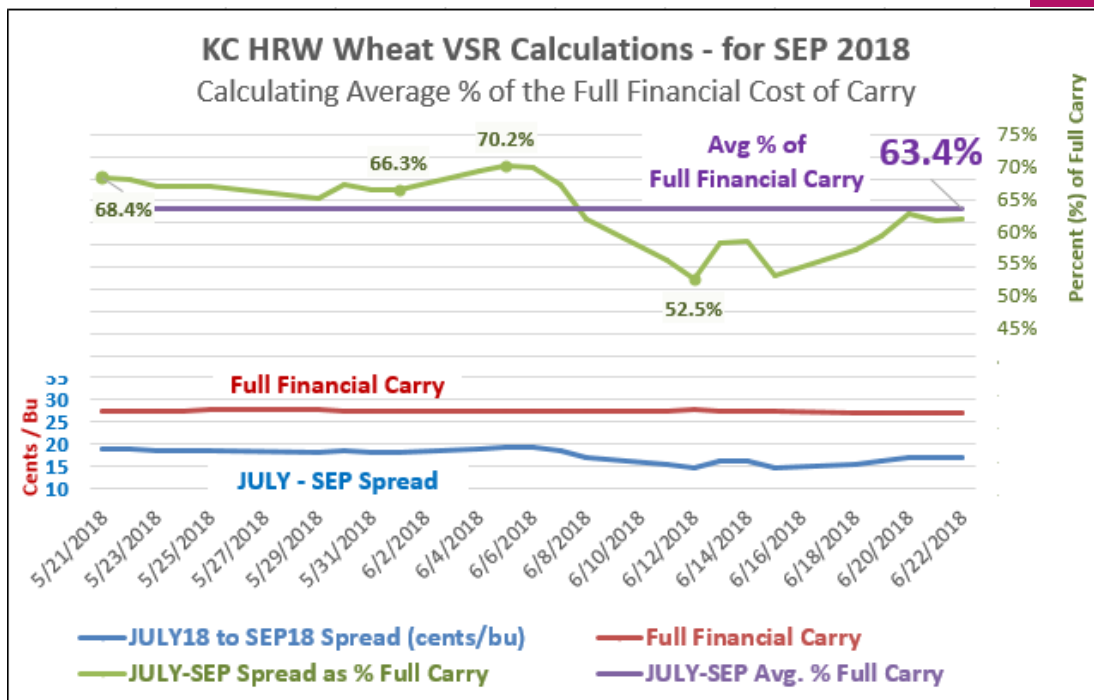
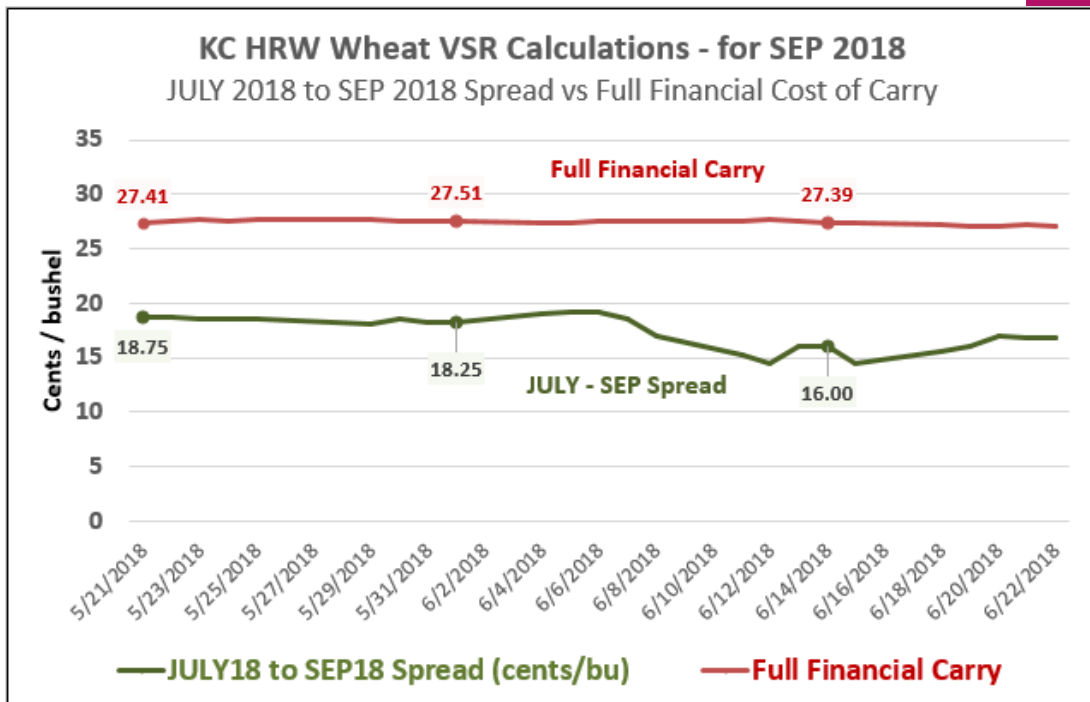
Variable Storage Rate July 2018 - Sept 2018 Calculation Period

July 2018 First Delivery Day	7/2/2018
September 2018 First Delivery Day	9/4/2018
Number of Carry Days	64
Storage Rate Used in Calculation	\$0.00365/bu/day
Running Average % of Full Carry	63.37%

Date	July 2018 Contract Price	Sep 2018 Contract Price	3M LIBOR Plus 200 Basis Points	Financial Full Carry	Jul18-Sep18 Spread	Jul-Sep Spread as % of Full Carry
5/21/2018	\$5.2650	\$5.4525	4.32938	0.274123	0.1875	68.4%
5/22/2018	\$5.4050	\$5.5925	4.33000	0.275206	0.1875	68.1%
5/23/2018	\$5.5175	\$5.7025	4.33000	0.276072	0.1850	67.0%
5/24/2018	\$5.4900	\$5.6750	4.33000	0.275861	0.1850	67.1%
5/25/2018	\$5.6400	\$5.8250	4.31938	0.276909	0.1850	66.8%
5/29/2018	\$5.5650	\$5.7450	4.31813	0.276321	0.1800	65.1%
5/30/2018	\$5.4075	\$5.5925	4.30719	0.275006	0.1850	67.3%
5/31/2018	\$5.4250	\$5.6075	4.30031	0.275074	0.1825	66.3%
6/1/2018	\$5.4075	\$5.5900	4.32125	0.275142	0.1825	66.3%
6/4/2018	\$5.2150	\$5.4050	4.31781	0.273631	0.1900	69.4%
6/5/2018	\$5.2900	\$5.4825	4.31381	0.274169	0.1925	70.2%
6/6/2018	\$5.3975	\$5.5900	4.31919	0.275045	0.1925	70.0%
6/7/2018	\$5.4450	\$5.6300	4.32088	0.275426	0.1850	67.2%
6/8/2018	\$5.3825	\$5.5525	4.32713	0.275006	0.1700	61.8%
6/11/2018	\$5.3475	\$5.5000	4.32631	0.274729	0.1525	55.5%
6/12/2018	\$5.5350	\$5.6800	4.33263	0.276233	0.1450	52.5%
6/13/2018	\$5.3900	\$5.5500	4.33563	0.275145	0.1600	58.2%
6/14/2018	\$5.2225	\$5.3825	4.34063	0.273900	0.1600	58.4%
6/15/2018	\$5.1975	\$5.3425	4.33469	0.273653	0.1450	53.0%
6/18/2018	\$4.9950	\$5.1500	4.32594	0.272014	0.1550	57.0%
6/19/2018	\$4.8300	\$4.9900	4.32469	0.270735	0.1600	59.1%
6/20/2018	\$4.8875	\$5.0575	4.33025	0.271225	0.1700	62.7%
6/21/2018	\$4.9325	\$5.1000	4.33188	0.271586	0.1675	61.7%
6/22/2018	\$4.8875	\$5.0550	4.33506	0.271267	0.1675	61.7%

VSR Calculator:
CME worksheet
 KS HRW Wheat
SEPT 2018
 CME Results





VSR #s: KS HRW Wheat SEP 2018 Contract

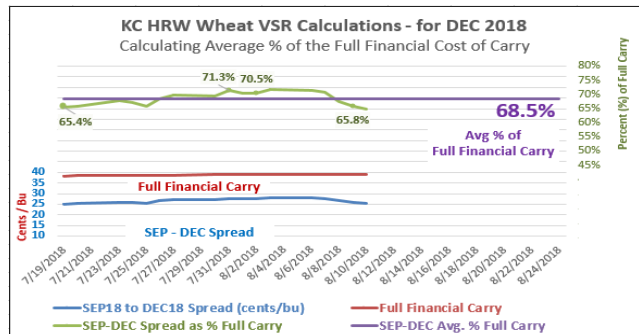
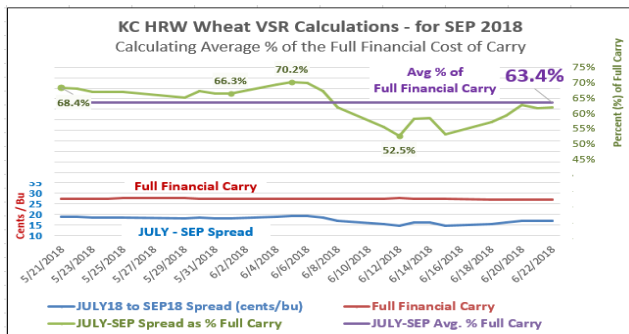
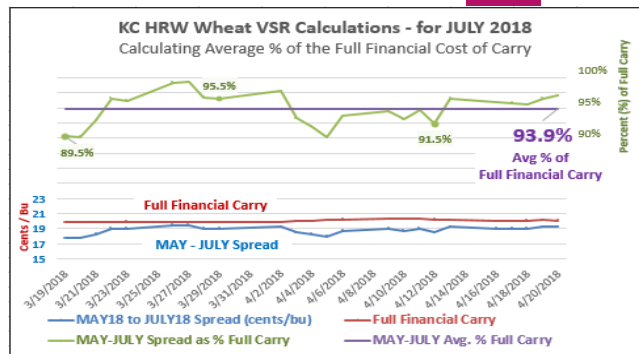
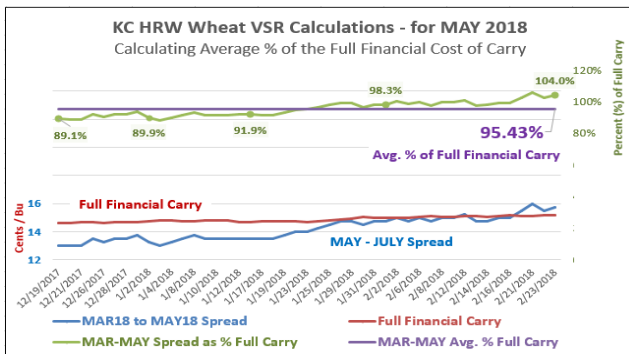
- Current Maximum Premium (Storage) Charge**

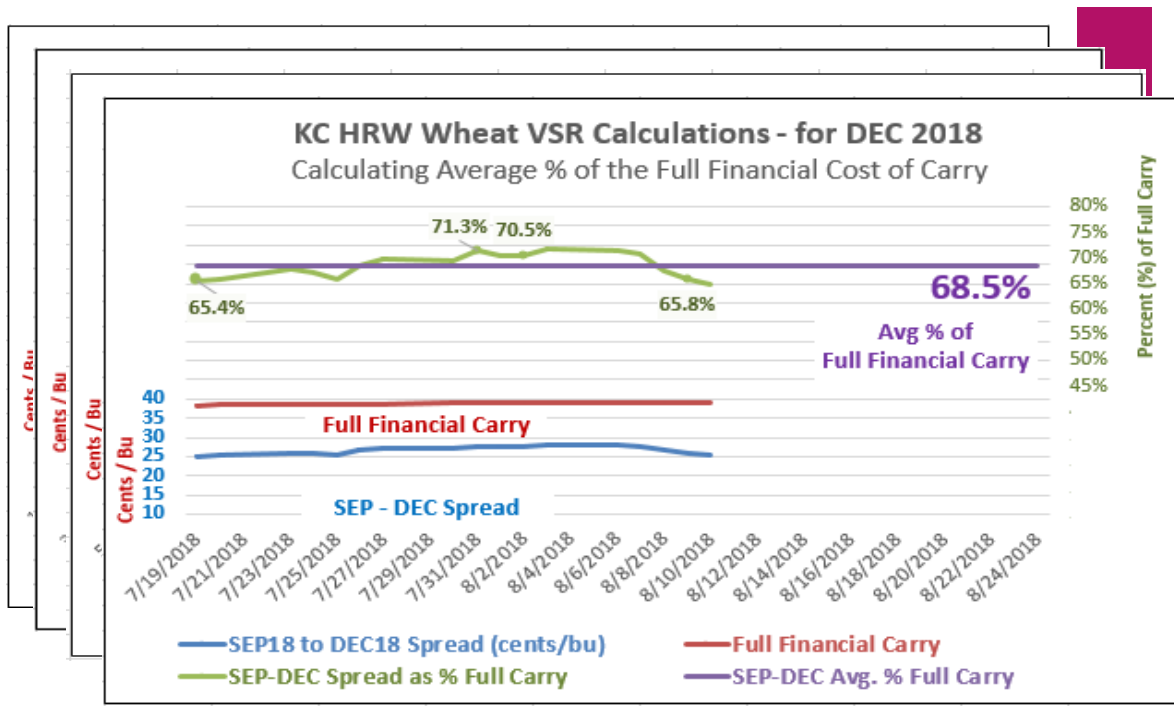
- \$0.00365/bu/day (x 30 days = \$0.10⁹⁵ /mo.)

- ~~IF Avg. % of Full Carry is $\geq 80\%$, the Max. Storage Charge increases to \$0.00465 (~ \$0.14⁸⁵ /mo.)~~

- IF Avg. % of Full Carry is $> 50\%$ & $< 80\%$, Max. Storage Charge stays at \$0.00365/bu/day (\approx \$0.10⁹⁵ /mo.) ****

- ~~IF Avg. % of Full Carry is $< 50\%$, Max. Storage Charge decreases to \$0.00265 (\approx \$0.08⁸⁵ /mo.)~~





Question: Has VSR affected volume of trade in "Lead" vs "Deferred" HRW Wheat Futures?

Futures Detail

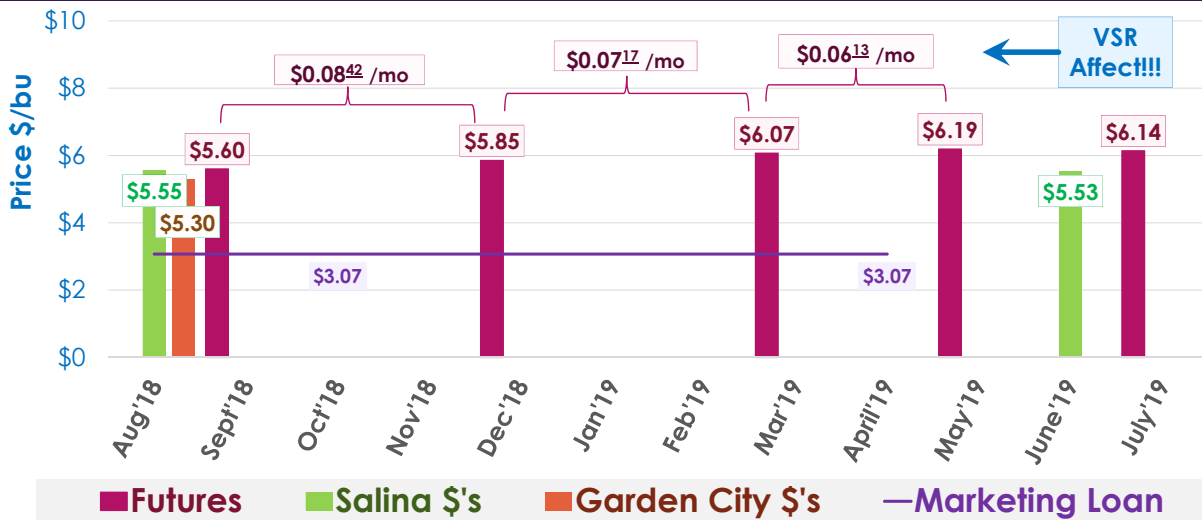
[Refresh](#)

More Info		Month	Last	Chg	% Chg	Open	High	Low	Previous	Volume	Open Int	Trade Time
chart	options	Sep-18	548'2	-11'4	-2.05	559'4	561'6	548'2	559'6	40296	77417	08/13/18 06:31
chart	serial options	Oct-18	---	---	0	---	---	---	---	---	---	---
chart	serial options	Nov-18	---	---	0	---	---	---	---	---	---	---
chart	options	Dec-18	573'6	-11'2	-1.92	585'0	587'0	573'4	585'0	46882	117726	08/13/18 06:31
chart	options	Mar-19	595'6	-10'6	-1.77	605'4	608'4	595'6	606'4	16736	48669	08/13/18 06:32
chart	options	May-19	609'0	-9'6	-1.58	618'6	620'4	609'0	618'6	5564	11931	08/13/18 06:24
chart	options	Jul-19	607'0	-6'6	-1.1	613'6	617'0	606'2	613'6	3848	18965	08/13/18 06:25
chart	options	Sep-19	621'0	-0'6	-0.12	622'0	625'0	621'0	621'6	665	1182	08/12/18 19:55
chart	options	Dec-19	635'6s	-10'6	-1.66	646'2	648'4	635'0	646'4	640	3428	08/10/18 13:19
chart	options	Mar-20	643'4s	-9'2	-1.42	650'2	652'0	645'0	652'6	19	155	08/10/18 13:15
chart	options	May-20	636'6s	-9'2	-1.43	---	---	---	646'0	0	3	08/10/18 13:15
chart	options	Jul-20	612'6s	-9'2	-1.49	622'0	622'0	612'4	622'0	9	146	08/10/18 13:15
chart	options	Sep-20	612'6s	-9'2	-1.49	---	---	---	622'0	0	2	08/10/18 13:15
chart	options	Dec-20	617'0s	-9'0	-1.44	---	---	---	628'0	0	2	08/10/18 13:15
chart	options	Mar-21	619'0s	-9'0	-1.43	---	---	---	628'0	0	0	08/10/18 13:15
chart	options	May-21	619'0s	-9'0	-1.43	---	---	---	628'0	0	0	08/10/18 13:15
chart	options	Jul-21	609'2s	-9'0	-1.46	---	---	---	618'2	0	6	08/10/18 13:15

Mon, Aug 13, 2018 6:42 AM CDT *Quotes are in market time

Wheat Cash & HRW Wheat Futures

Salina & Garden City, KS Local Elevators - August 10, 2018



Observations on the Effectiveness & Impact of VSR on HRW Wheat Futures

DARRELL HOLADAY – COUNTRY FUTURES INC.

Summary – Barnaby, et al.

1. HRW wheat futures are not trading the value of wheat, they are trading the value of a warehouse receipt / shipping certificate, that currently has a fixed storage rate.
 - o Corn & soybean shipping certificates also have a fixed storage rate; this could change in the future.
2. When there is a big crop, the VSR storage rate should increase & ration out the available supply of storage. Currently for HRW wheat the fixed storage rate prevents the market adjustment.
 - o The VSR will allow the market to find the real value of storage & the resulting value of wheat.

Summary – Barnaby, et al.

3. As the contracts roll over & the VSR drives the storage rate higher, at some point it will no longer be profitable for the long to pay the storage cost.
 - o Then they will convert the “*paper*” into real wheat – causing futures & cash prices at delivery points to converge.
4. Farmers can't ship 5 truck loads of real wheat to Salina & deliver to offset a futures position.
 - o Effectively famers can't make delivery on futures – BUT they can be delivered on.

Summary – Barnaby, et al.

5. The only “people” who can make delivery on HRW wheat are the large multi-national elevators.
 - o In a normal market, only a few deliveries are required to cause convergence.

6. These same designated delivery elevators must have a strong *balance sheet* combined with “adequate storage” to be approved for delivery by CME (i.e., to be “declared regular”).

Summary – Barnaby, et al.

7. Farmers should NOT carry a short futures position into the delivery period thinking they have the leverage of delivery – because they DON'T.
 - o The only way out of short futures is to buy back their contract.

8. The academic argument is “a farmer might find an elevator that would be willing to take delivery IF the farmer were to purchase a warehouse receipt in the secondary market.”
 - o ***However*** – after paying par value for the receipt, it prevents the farmer from arbitraging the non-convergence.



***Non-Convergence &
Variable Storage Rates in
CME Kansas HRW Wheat Futures***

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