Input Prices and 2022 Price Outlook

Marketing Meeting

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Take Home Message

- Need to be thinking about profit maximizing decisions not yield maximizing

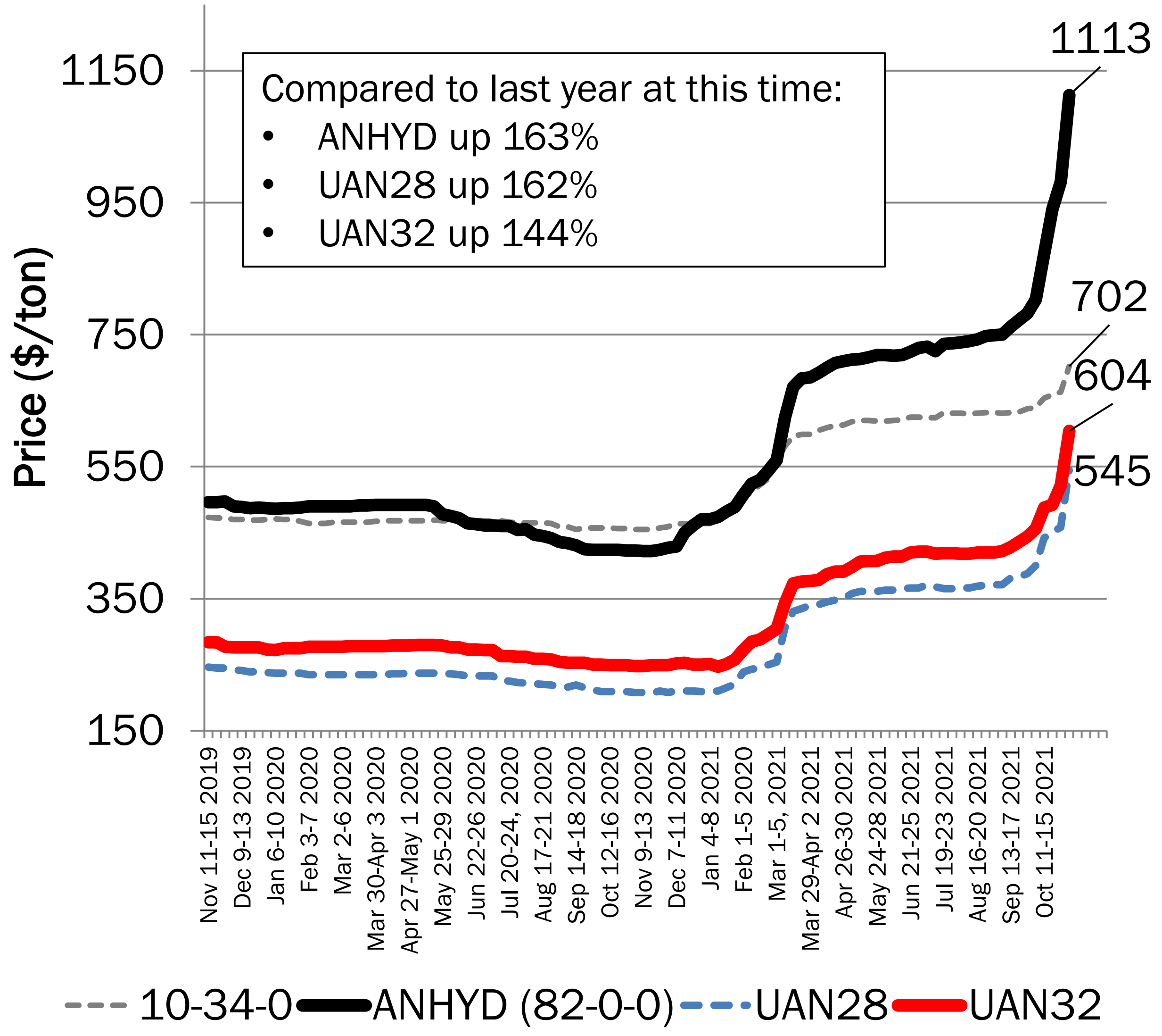
- More aggressive with output price risk management.

Inputs Prices and Availability

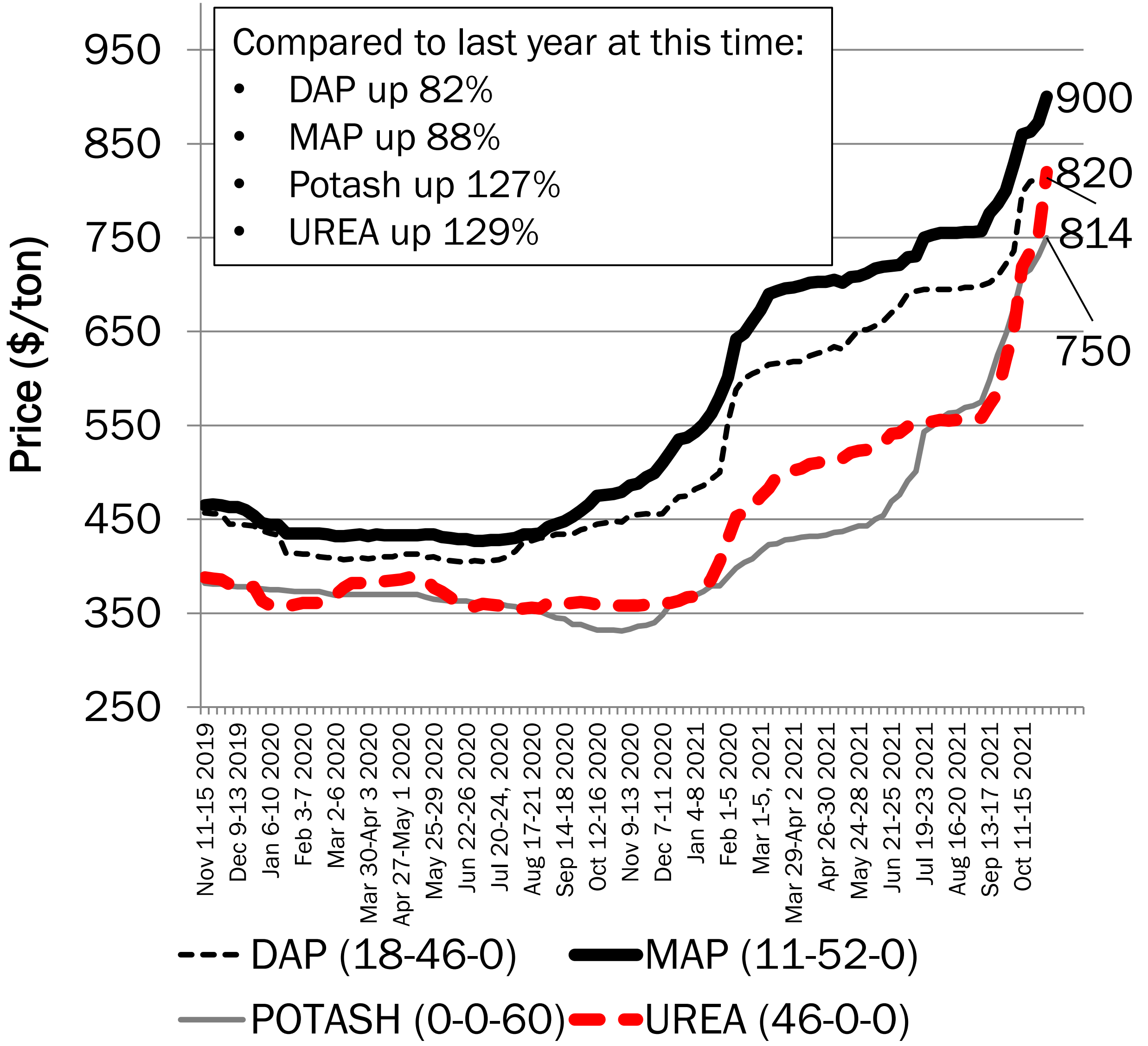
- Land prices and rents are up.
- Prices for most crop protection products and fertilizers are up substantially.
- Availability of inputs is currently a concern.
- Labor shortages.
- Trucking and logistical issues.

- Will prices be cheaper before crops are planted in 2022?

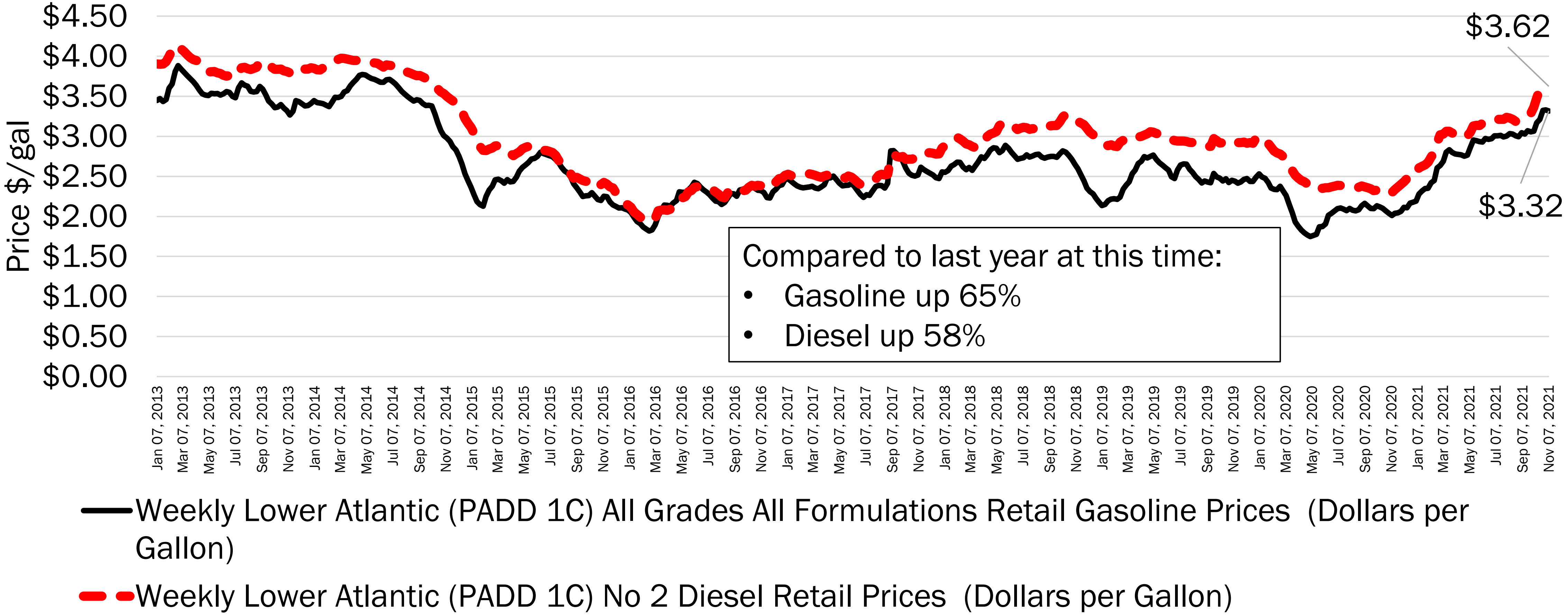
Liquid Fertilizer Price, 2014-2021



Dry Fertilizer Price, 2014-2021

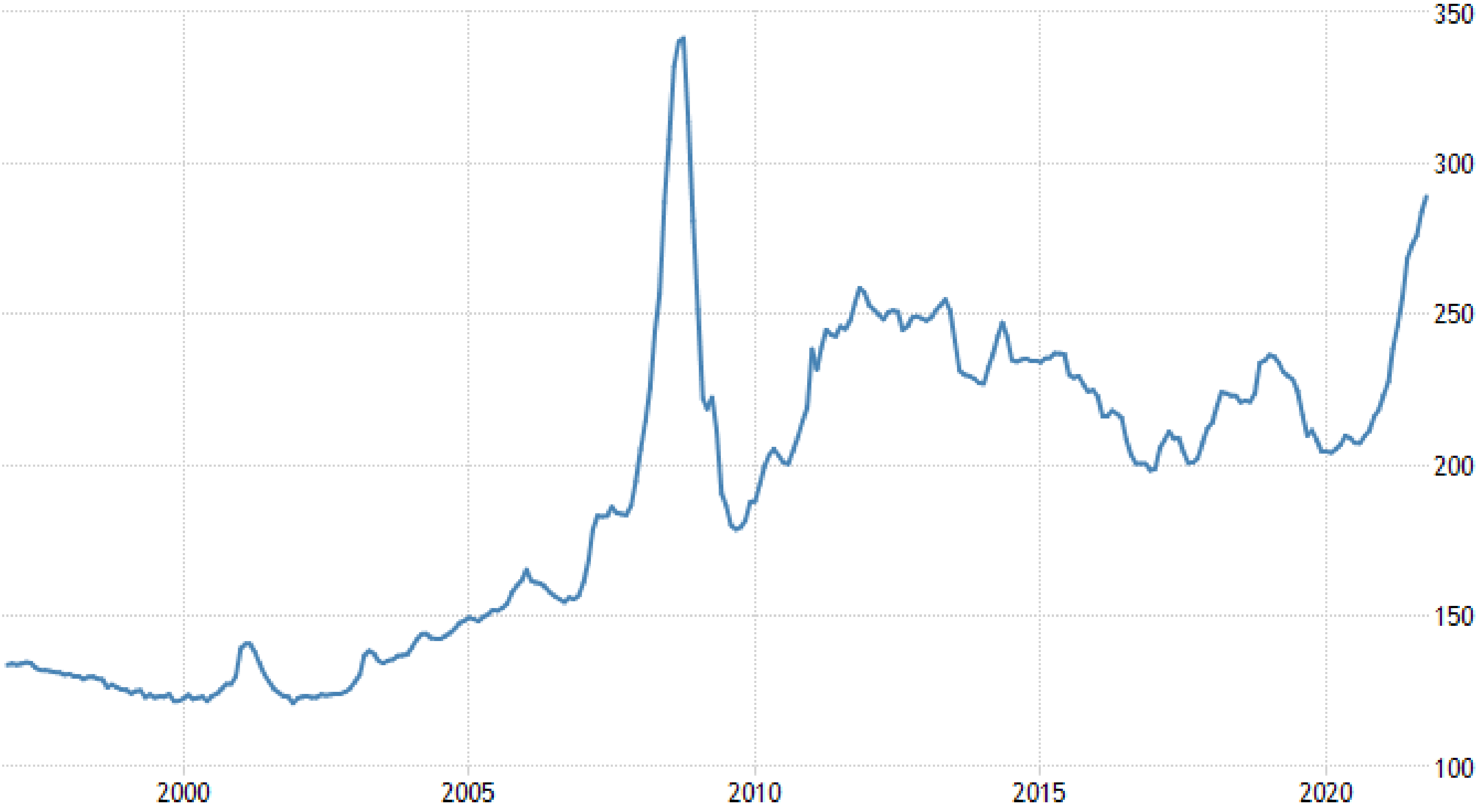


Weekly Diesel and Gasoline Prices, 2013-2021



Source: U.S. EIA- https://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_r1z_w.htm

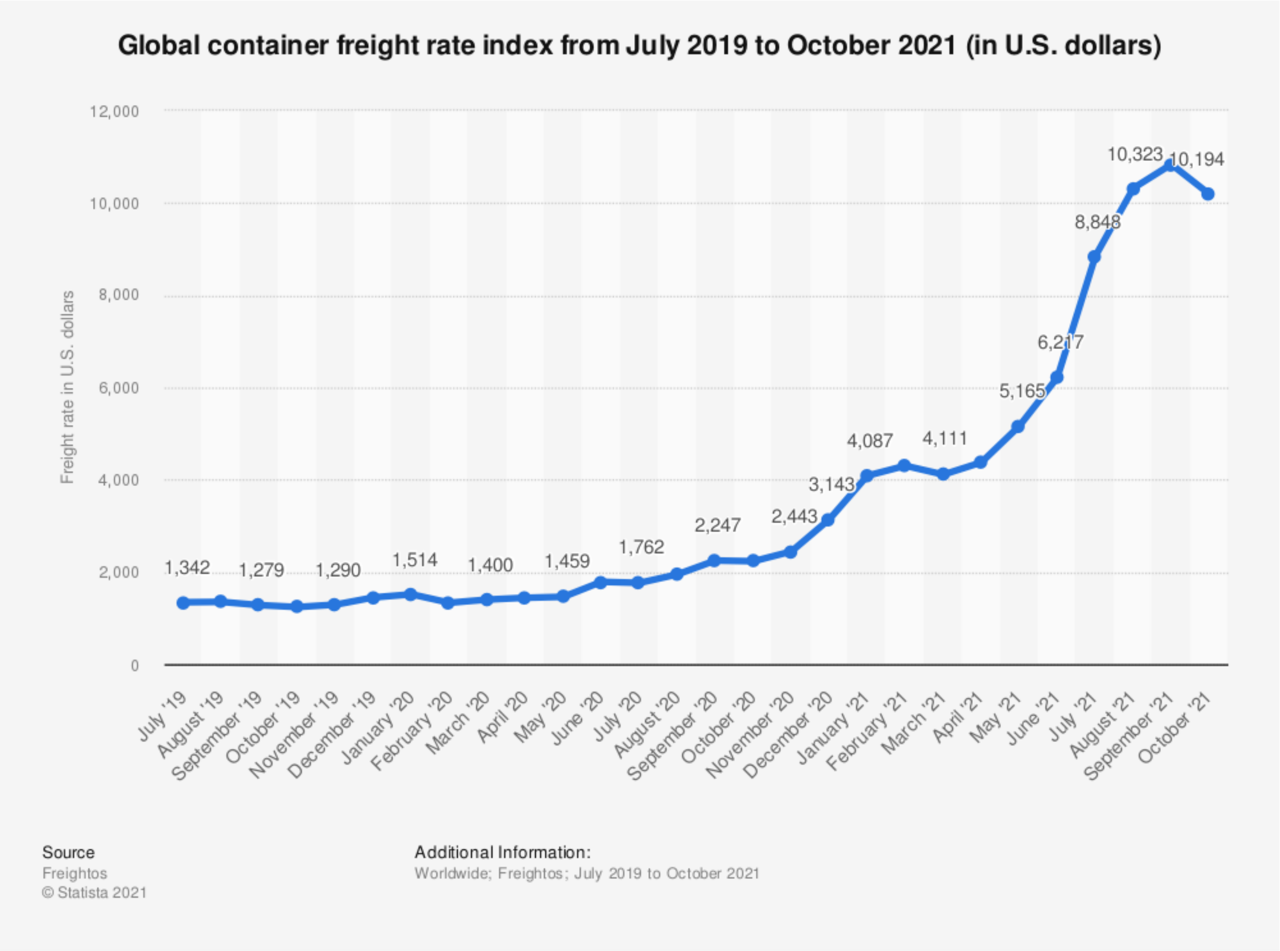
United States - Producer Price Index by Commodity for Chemicals and Allied Products: Agricultural Chemicals and Chemical Products



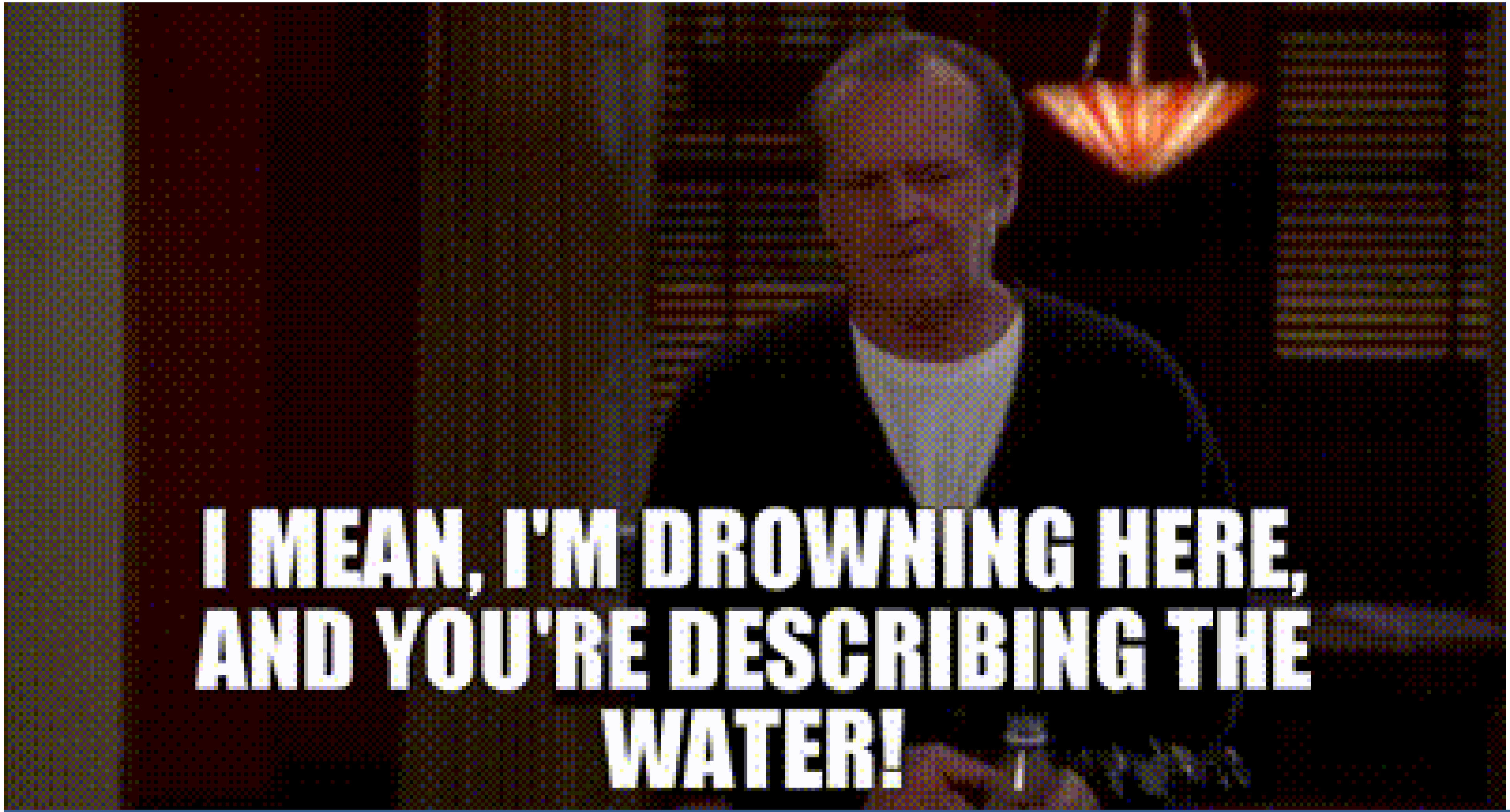
Price and availability is a major concern for many agricultural crop protection products.

New price on roundup just out today…$55.30/Gal.

Source: Trading Economics -https://tradingeconomics.com/united-states/producer-price-index-by-commodity-for-chemicals-and-allied-products-agricultural-chemicals-and-chemical-products-fed-data.html#:~:text=and%20Chemical%20Products-,United%20States%20%2D%20Producer%20Price%20Index%20by%20Commodity%20for%20Chemicals%20and,the%20United%20States%20Federal%20Reserve.



- Shipping rates are showing signs of coming down but are still way above year ago levels.
- Tariffs remain an issue on fertilizer inputs (i.e. Russia and Morocco).
- China's energy crisis has further restricted global supplies.
- Production disruptions due to hurricanes and covid-19 shutdowns.



SO, WHAT CAN YOU DO?

What can you do?

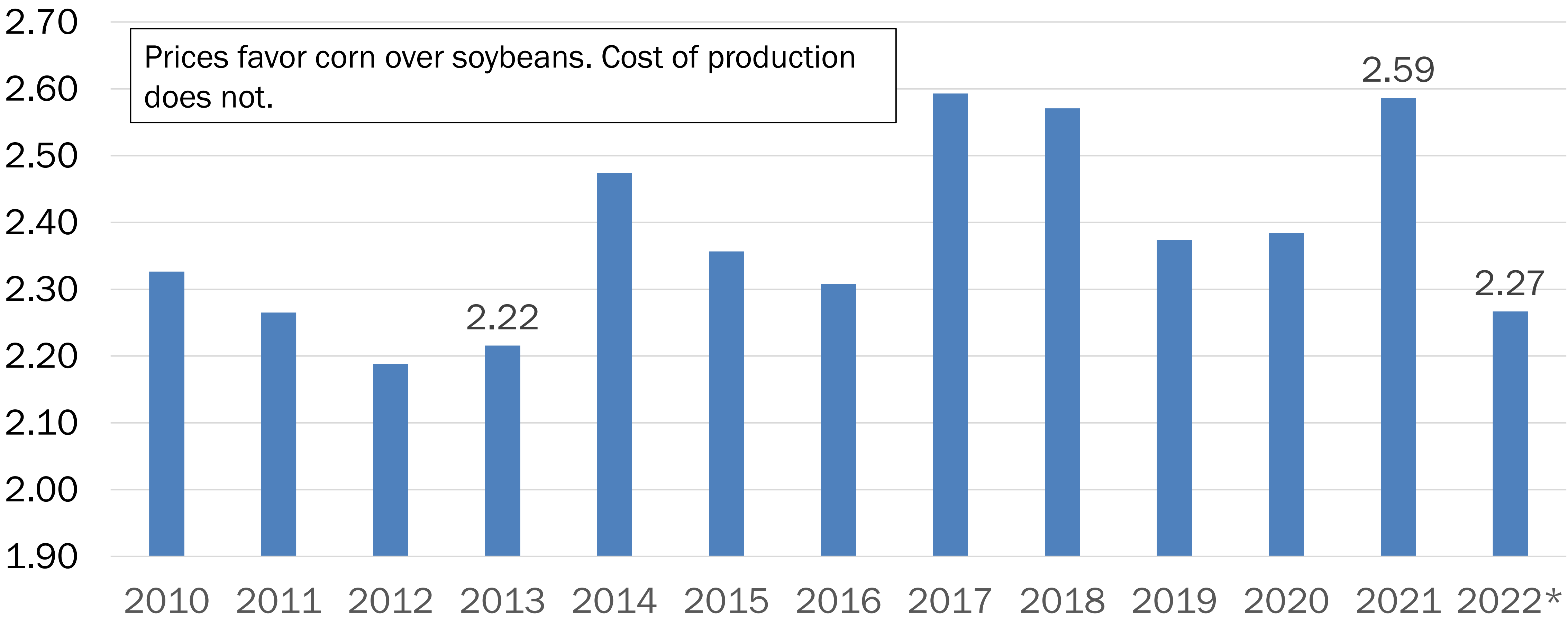
- Timing
  - Fall applications
  - Pre purchases
  - Buy inputs and store
  - Wait to spring
- Bulk discounts
  - Pooling purchases with neighbors or extended family
- Purchase source
  - Shop around vs value of a relationship
  - Online or alternative source purchases

Most of these strategies will not result in dramatic reductions in cost in the current environment.

Reducing Input Costs

- Not an easy task and will require creativity.
  - Soil testing – know what you have.
  - Alternative nutrient sources – poultry litter, manure, other.
  - Eliminate products that are not contributing to sufficient yield gains relative to costs.
  - You will need a plan A, B, C…. If “typical” inputs are not available.
  - Crop rotation.
    - High input cost versus low input cost commodities.
    - Profitability comparison and mange price risk.
  - Crop share leases – balance the risk/reward.
  - Maximum Return to Nitrogen (MRTN).
  - Protect output prices / manage the margin.

Soybean-to-Corn Harvest Price Ratio, December 1 to March 31



* Ratio as at November 15, 2021

Near $1,000 per Acre in Expenses for Corn

- Land ($180)
- Seed ($120)
- Fertilizer ($254):
  - Nitrogen = $0.91 x 151 lb/acre = $137.41
  - Phosphorus = $0.68 x 70 lb/acre = $47.60
  - Potassium = $0.63 x 70 lb/acre = $44.10
  - Other =$25.00
- Chemical ($125)
- Machinery ($175)
- Labor ($30)
- Other / General Overhead ($60)

- Total specified expenses = $944/acre (still rising?)

- Projected Revenue $5.50 x 180 = $990/acre.

Corn – Net Return Table ($944/acre cost of production)

Yield (bu/acre)

Price ($/bu)	130	140	150	160	170	180	190	200	210	220	230
3.50	(489)	(454)	(419)	(384)	(349)	(314)	(279)	(244)	(209)	(174)	(139)
3.75	(457)	(419)	(382)	(344)	(307)	(269)	(232)	(194)	(157)	(119)	(82)
4.00	(424)	(384)	(344)	(304)	(264)	(224)	(184)	(144)	(104)	(64)	(24)
4.25	(392)	(349)	(307)	(264)	(222)	(179)	(137)	(94)	(52)	(9)	34
4.50	(359)	(314)	(269)	(224)	(179)	(134)	(89)	(44)	1	46	91
4.75	(327)	(279)	(232)	(184)	(137)	(89)	(42)	6	54	101	149
5.00	(294)	(244)	(194)	(144)	(94)	(44)	6	56	106	156	206
5.25	(262)	(209)	(157)	(104)	(52)	1	54	106	159	211	264
5.50	(229)	(174)	(119)	(64)	(9)	46	101	156	211	266	321
5.75	(197)	(139)	(82)	(24)	34	91	149	206	264	321	379
6.00	(164)	(104)	(44)	16	76	136	196	256	316	376	436
6.25	(132)	(69)	(7)	56	119	181	244	306	369	431	494
6.50	(99)	(34)	31	96	161	226	291	356	421	486	551
6.75	(67)	1	69	136	204	271	339	406	474	541	609
7.00	(34)	36	106	176	246	316	386	456	526	596	666
7.25	(2)	71	144	216	289	361	434	506	579	651	724

Near $700 per Acre in Expenses for Soybeans

- Land ($180)
- Seed ($64)
- Fertilizer ($83):
  - Phosphorus = $0.68 x 30 lb/acre = $20.40
  - Potassium = $0.63 x 60 lb/acre = $37.80
  - Other =$25.00
- Chemical ($125)
- Machinery ($165)
- Labor ($30)
- Other / General Overhead ($60)

- Total specified expenses = $707/acre (still rising?)

- Projected Revenue $12.50 x 60 = $750/acre.

Soybean – Net Return Table ($707/acre cost of production)

Yield (bu/acre)

	35	40	45	50	55	60	65	70	75	80	85
10.00	(357)	(307)	(257)	(207)	(157)	(107)	(57)	(7)	43	93	143
10.25	(348)	(297)	(246)	(195)	(143)	(92)	(41)	11	62	113	164
10.50	(340)	(287)	(235)	(182)	(130)	(77)	(25)	28	81	133	186
10.75	(331)	(277)	(223)	(170)	(116)	(62)	(8)	46	99	153	207
11.00	(322)	(267)	(212)	(157)	(102)	(47)	8	63	118	173	228
11.25	(313)	(257)	(201)	(145)	(88)	(32)	24	81	137	193	249
11.50	(305)	(247)	(190)	(132)	(75)	(17)	41	98	156	213	271
11.75	(296)	(237)	(178)	(120)	(61)	(2)	57	116	174	233	292
12.00	(287)	(227)	(167)	(107)	(47)	13	73	133	193	253	313
12.25	(278)	(217)	(156)	(95)	(33)	28	89	151	212	273	334
12.50	(270)	(207)	(145)	(82)	(20)	43	106	168	231	293	356
12.75	(261)	(197)	(133)	(70)	(6)	58	122	186	249	313	377
13.00	(252)	(187)	(122)	(57)	8	73	138	203	268	333	398
13.25	(243)	(177)	(111)	(45)	22	88	154	221	287	353	419
13.50	(235)	(167)	(100)	(32)	36	103	171	238	306	373	441
13.75	(226)	(157)	(88)	(20)	49	118	187	256	324	393	462

Crop Share Arrangements

	2022	2021
Price ($/bu)	$5.50	$4.17
Yield (bu/acre)	180	180
Expenses (excluding land)	$764	$530
Revenue	$990	$750
1/4 Revenue Share	**$248**	**$188**
Profit	$(22)	$33

Need to have conversations with landowners if you are using a crop share arrangement.

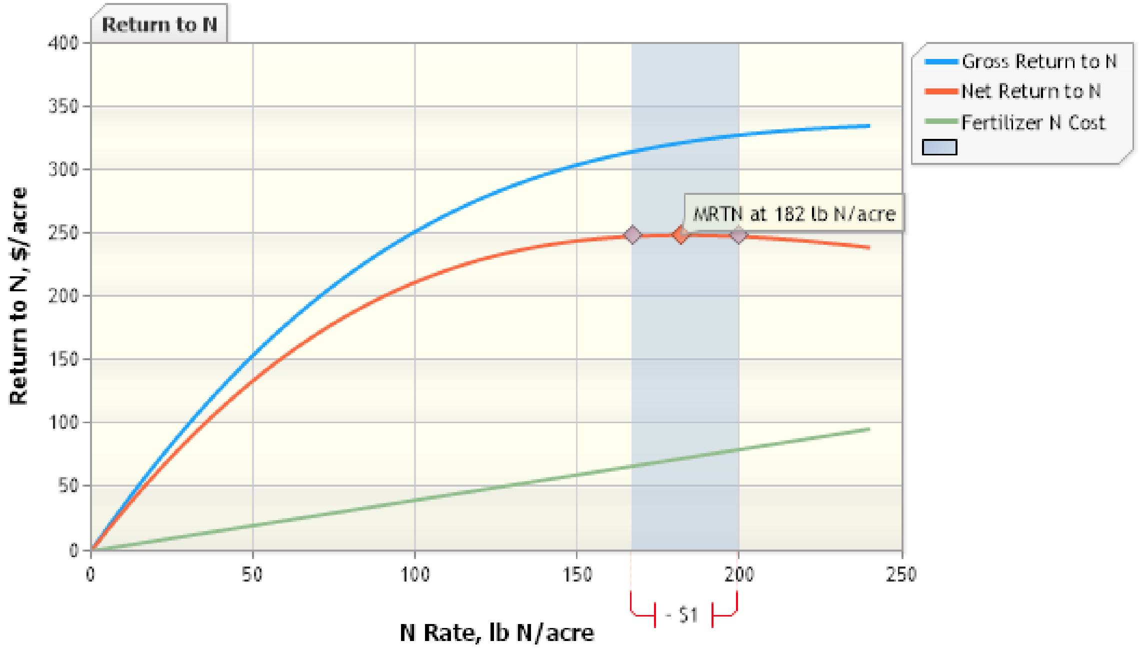
The risk profile has changed dramatically.
Possible solutions: Move to cash rent or negotiate a portion of the expenses to the landowner.

Rates and Charts

State: Ohio
Number of sites: 228
Rotation: Corn Following Soybean

2021

Nitrogen Price ($/lb):	0.40
Corn Price ($/bu):	4.17
Price Ratio:	0.10
MRTN Rate (lb N/acre):	182
Profitable N Rate Range (lb N/acre):	166 - 199
Net Return to N at MRTN Rate ($/acre):	$248.82
Percent of Maximum Yield at MRTN Rate:	98%
Urea (45% N) at MRTN Rate (lb product/acre):	404
Urea (45% N) Cost at MRTN Rate ($/acre):	$72.80

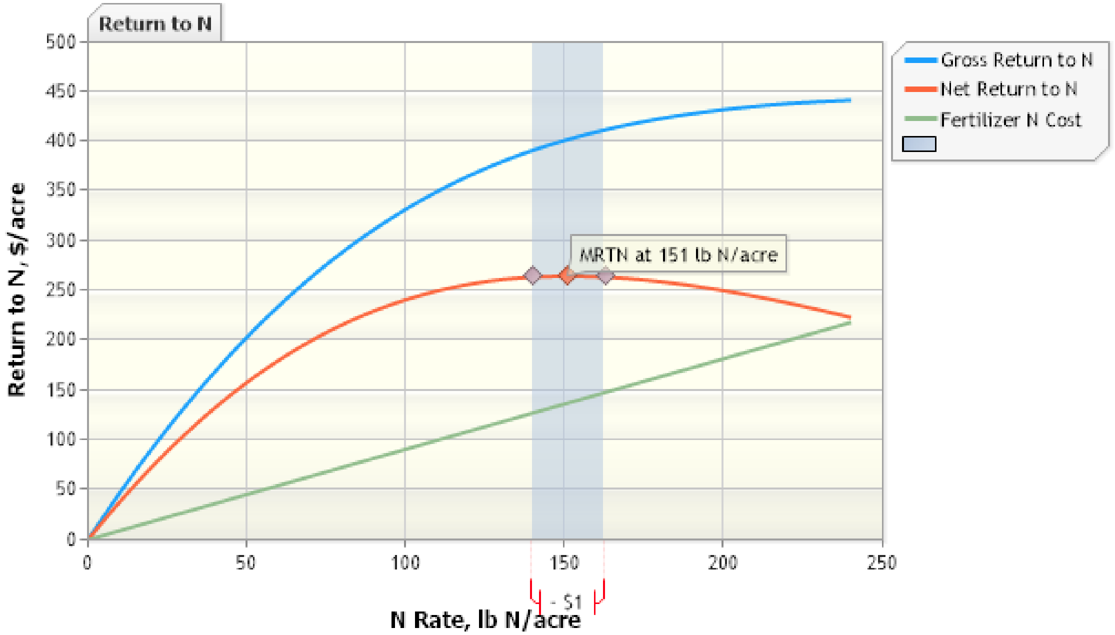


Rates and Charts

State: Ohio
Number of sites: 228
Rotation: Corn Following Soybean

2022

Nitrogen Price ($/lb):	0.91
Corn Price ($/bu):	5.50
Price Ratio:	0.17
MRTN Rate (lb N/acre):	151
Profitable N Rate Range (lb N/acre):	139 - 162
Net Return to N at MRTN Rate ($/acre):	$264.88
Percent of Maximum Yield at MRTN Rate:	96%
Urea (45% N) at MRTN Rate (lb product/acre):	335
Urea (45% N) Cost at MRTN Rate ($/acre):	$137.41

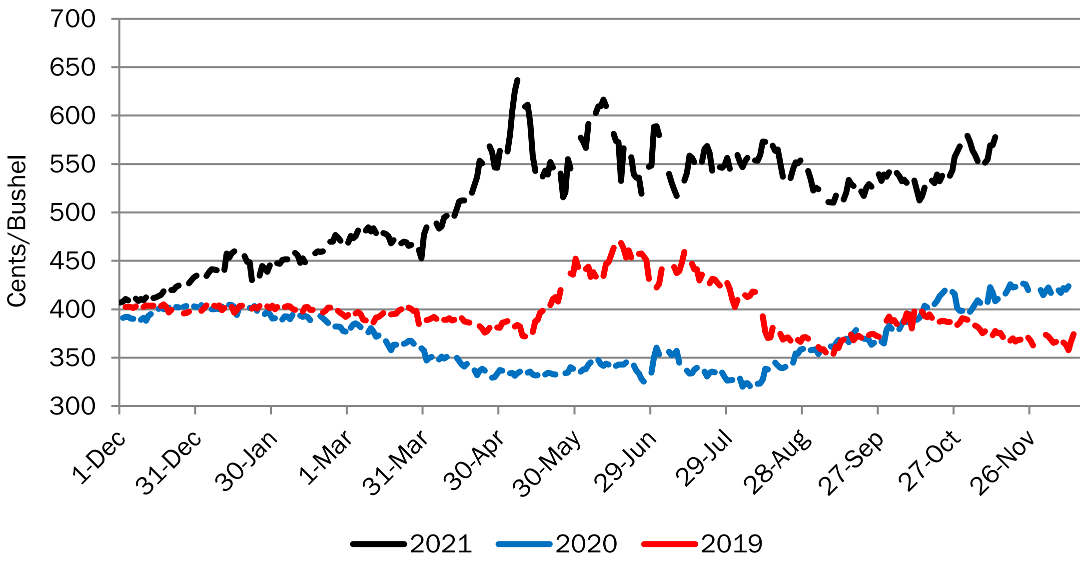


Need for Risk Management

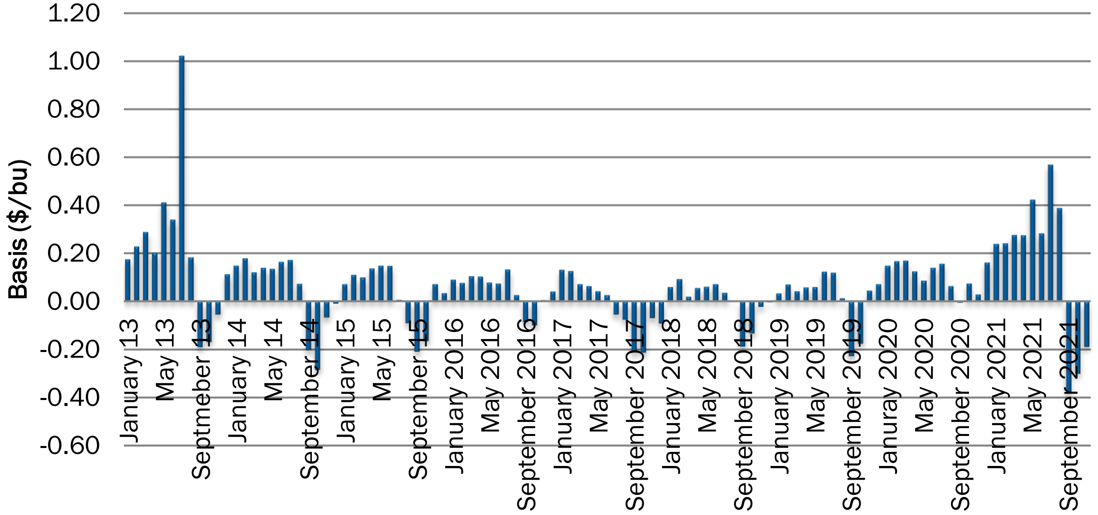
- For row crop producers, there are more risk management tools available to manage output price risk than input price risk.

- Risk management tools need to be utilized this fall/winter to avoid potential catastrophic outcomes.
  - Buy high input prices + corn soybean price declines = substantial losses.
  - Crop insurance protection is over three months out!

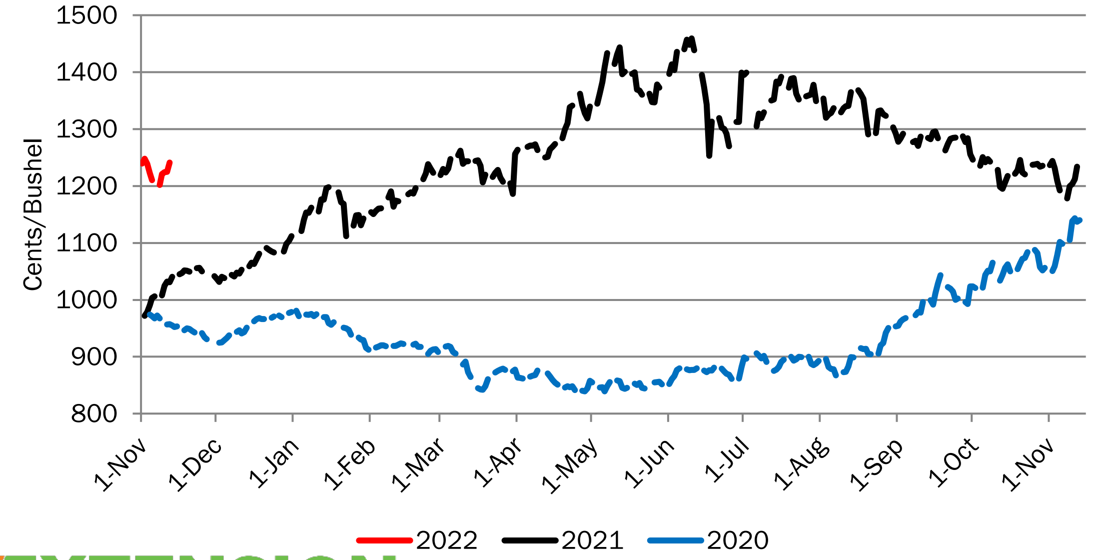
December Corn Futures



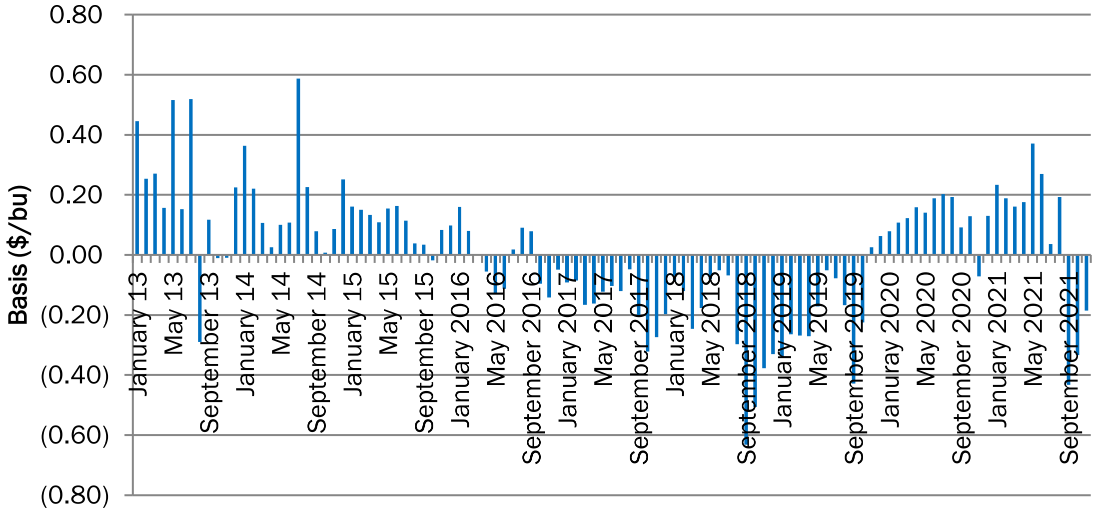
Tennessee Average Monthly Corn Basis (Elevators and Barge Points), 2013-2021



November Soybean Futures



Tennessee Monthly Average Soybean Basis (Elevators and Barge Points), 2013-2021

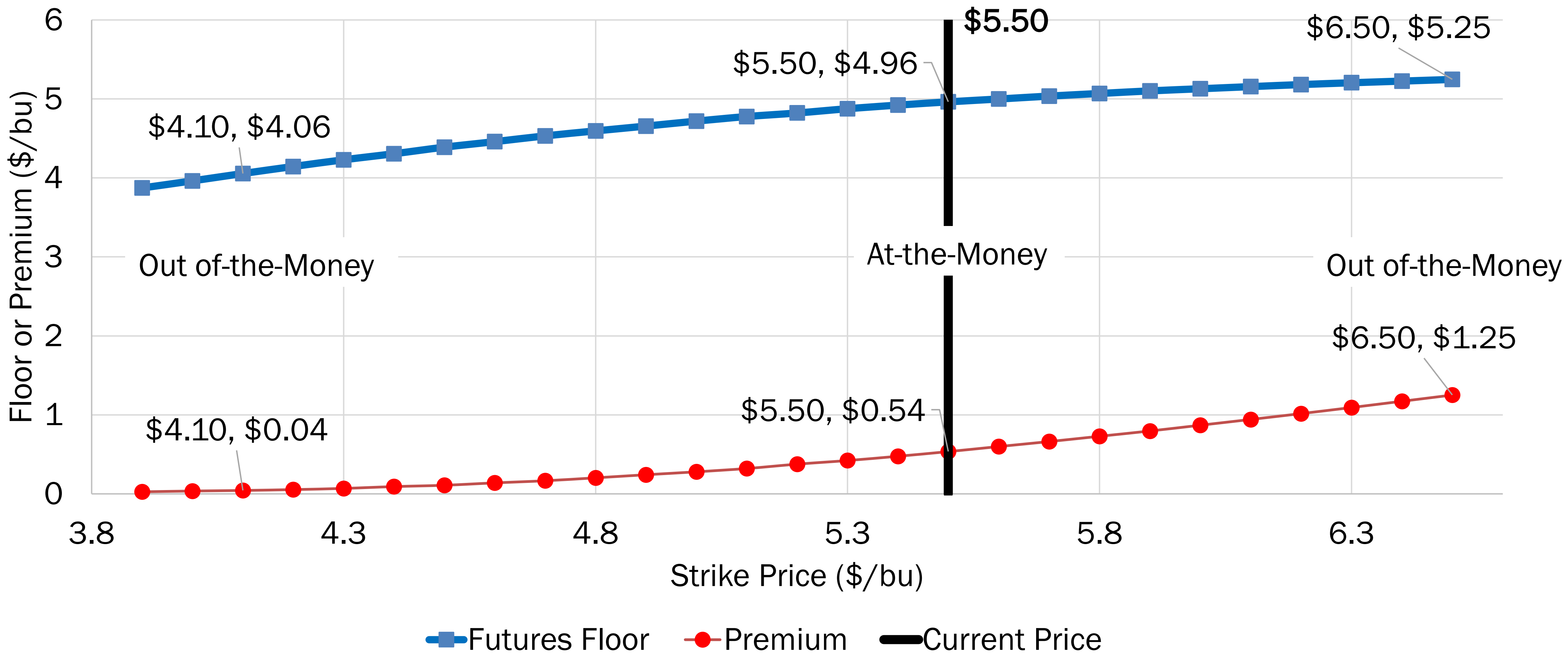


2022 Harvest Futures: November Soybean (red and green) and December Corn (black and blue)

Put Options

- Sets a futures price floor.
- Defined loss (equals premium).
- No margin requirements (if buying).
- Allows you to benefit if the futures market strengthens.
- Does not set the basis.
- No requirement for delivery (does not add production risk).

Futures Price Floor Versus Premium Cost for Select December 2022 Corn, November 15, 2021



Example #1

- Buy a $5.00 December 2022 put option for 27 cents, sets a $4.73 per bushel futures price floor.
  - If Dec FC>$5.00, then option has no value.
  - If Dec FC<$4.73, then value = $4.73-Dec FC
- Assuming a projected yield or 180 bu/acre
  - Provides a projected revenue floor of $851/acre (180 bu/acre x $4.73).
  - $944 - $851 = $93/acre, unprotected <u>if yield is achieved</u>.
- Cost for 1,000 acres
  - 180 bu acre x 1,000 = 180,000 bu
  - 180,000 x $0.27 = $48,600
- Remove 86% of the futures price risk ($4.73/$5.50)

Example #2

- Buy a $4.10 December 2022 put option for 5 cents, sets a $4.05 per bushel futures price floor.
  - If Dec FC>$4.10, then option has no value.
  - If Dec FC<$4.05, then value = $4.05-Dec FC
- Assuming a projected yield or 180 bu/acre
  - Provides a projected revenue floor of $729/acre (180 bu/acre x $4.05).
  - $944 - $729 = $215/acre, unprotected if yield is achieved.
- Cost for 1,000 acres
  - 180 bu acre x 1,000 acres = 180,000 bu
  - 180,000 x $0.05 = $9,000
- Remove 74% of the futures price risk ($4.05/$5.50)

Concluding Thoughts

- Between now and planting, nobody knows definitively if input prices will be higher, the same, or lower than current prices.
- The risk profile has dramatically changed compared to recent years.
- Crop insurance price determination is over three months away, a lot can change.
- If you are buying inputs, protect the value of the output through risk management.
- Inaction is a decision, usually not the correct one.

Thank you

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