2020 Potash Outlook

Handicapping the Scenarios

TFI Outlook Conference
Savannah, GA
November 20, 2019

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MRRC

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Safe Harbor

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Topics and Take-Aways

- Handicapping Lessons Since 2013
- The Bearish Scenario – The Downward Price Trend Continues
  - Global shipments will rebound less than expected in 2020
    - Still elevated channel inventories after record-shattering shipments in 2017-18 (plus high producer stocks even with recent “cutbacks”)
    - Cautious on-farm demand outlook due to continued low crop prices and a weak potash import currencies
    - And I still can’t get to 95+ million U.S. corn acres in 2020
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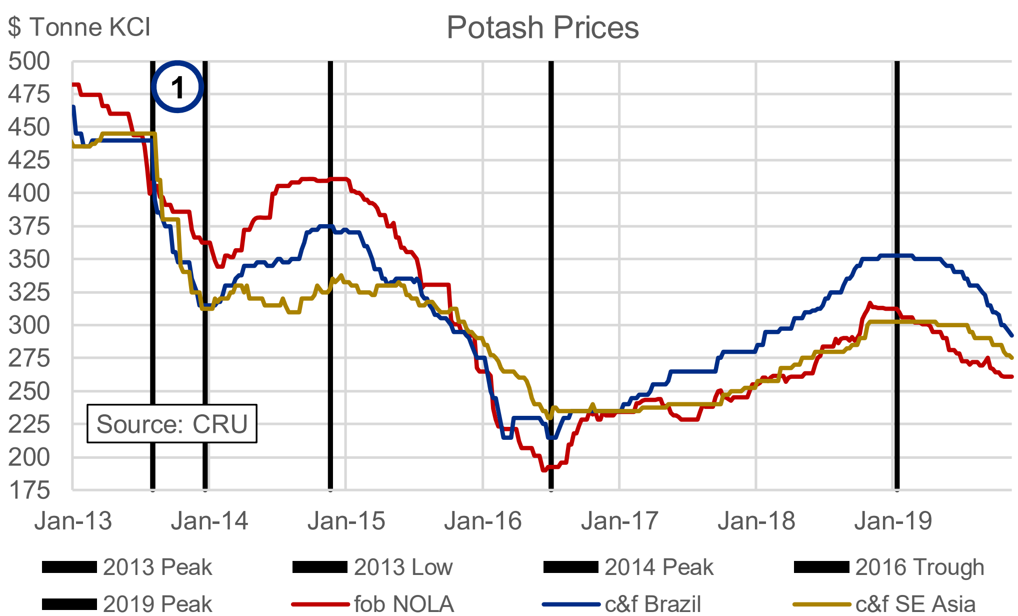
  - Producers likely will continue to throttle back output if warehouses fill up
- My Handicaps

Handicapping Lessons Since 2013



1 Uralkali shocks the market on July 30, 2013

1. Uralkali announced that it will withdraw from the BPC export association, operate at capacity in order to minimize unit costs, expects c&f prices to drop from roughly $400 to $300 tonne, and projects large demand increases in response to lower prices.
2. Producer shipments plunge and distribution channels freeze during the last half of 2013 given expectations of large price declines. Potash prices drop about $100 tonne by year end.

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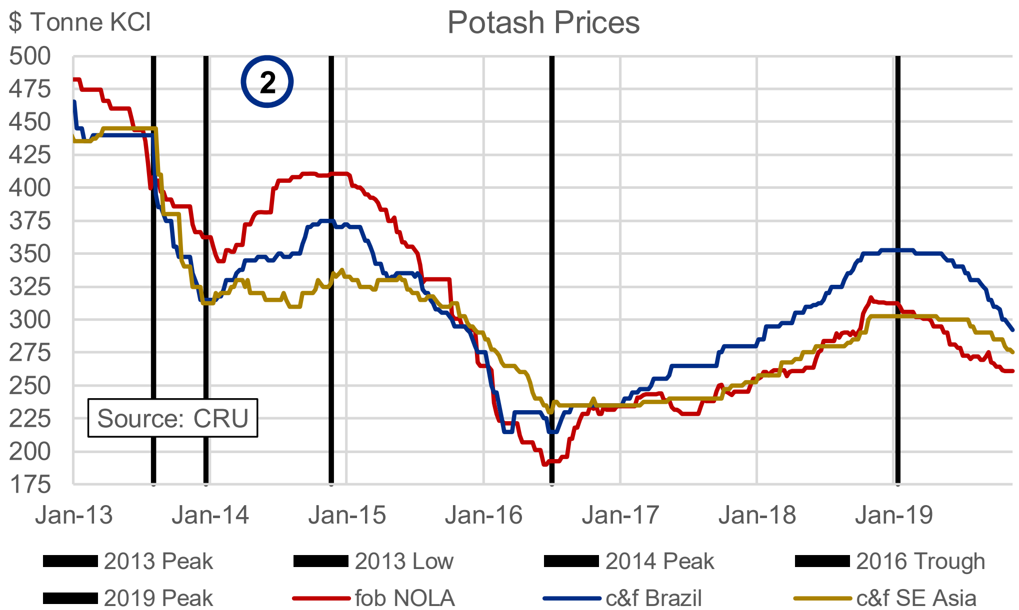
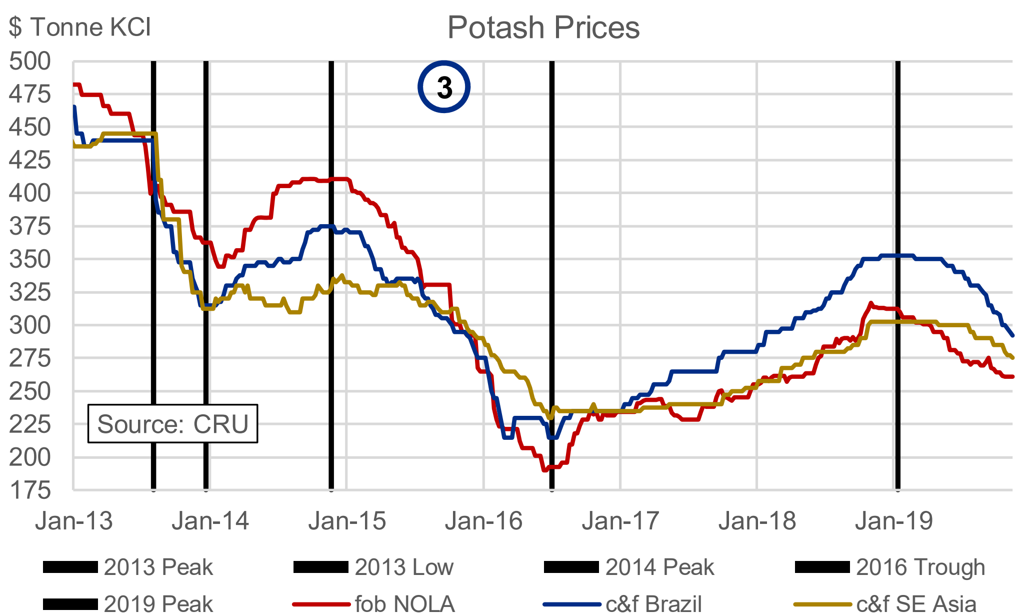
Handicapping Lessons Since 2013



② Distribution channel destocked and shipments surge

1. Distribution channels are de-stocked by the end of 2013. On-farm demand remains strong following record crop prices and farm income in 2012 and 2013.
2. Distributors rush to the market to position product as prices take off. Global KCl shipments surge from 55.9 million tonnes in 2013 to 64.8 million tonnes in 2014 resulting in a massive build of channel inventories. Prices recover part of the decline in 2013, but gains vary by market and grade.

Handicapping Lessons Since 2013



③ Post Mortem of the 2015-16 Collapse

1. Global shipments decline in both 2015 and 2016 as a result of destocking channel inventories following the massive build in 2014.
2. Five brownfield expansions start up in Canada from 2013 through 2015. Canpotex proving runs certified nearly 7.0 million tonnes of new capacity from these projects, but total production increases “only” 2.0 million tonnes in 2015.
3. CIS output also increases 2.0 million tonnes in 2015.
4. Industry costs drop significantly due to a collapse of key potash currencies and lower/less volatile raw materials and energy costs.

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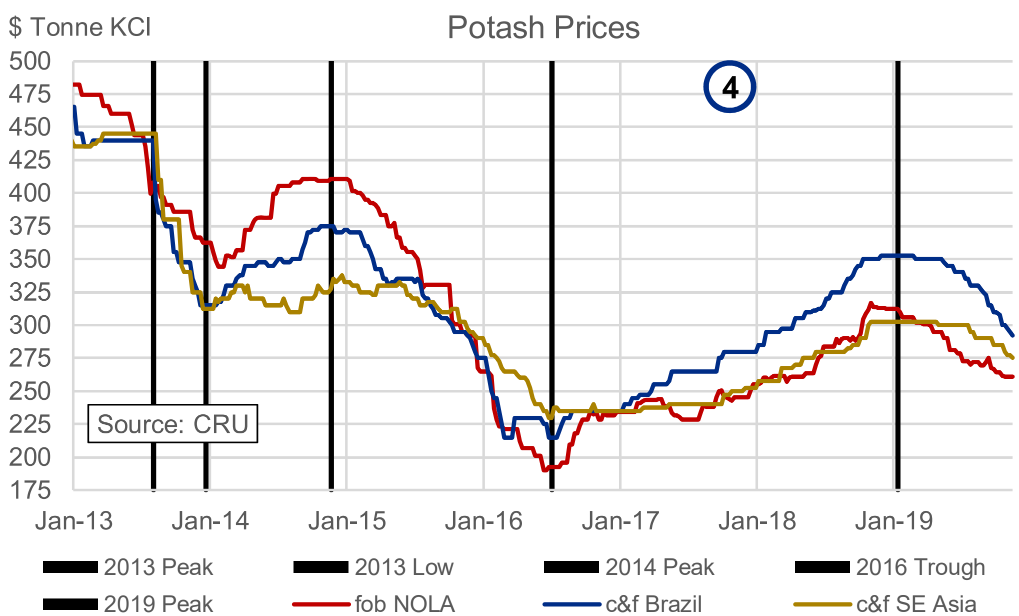
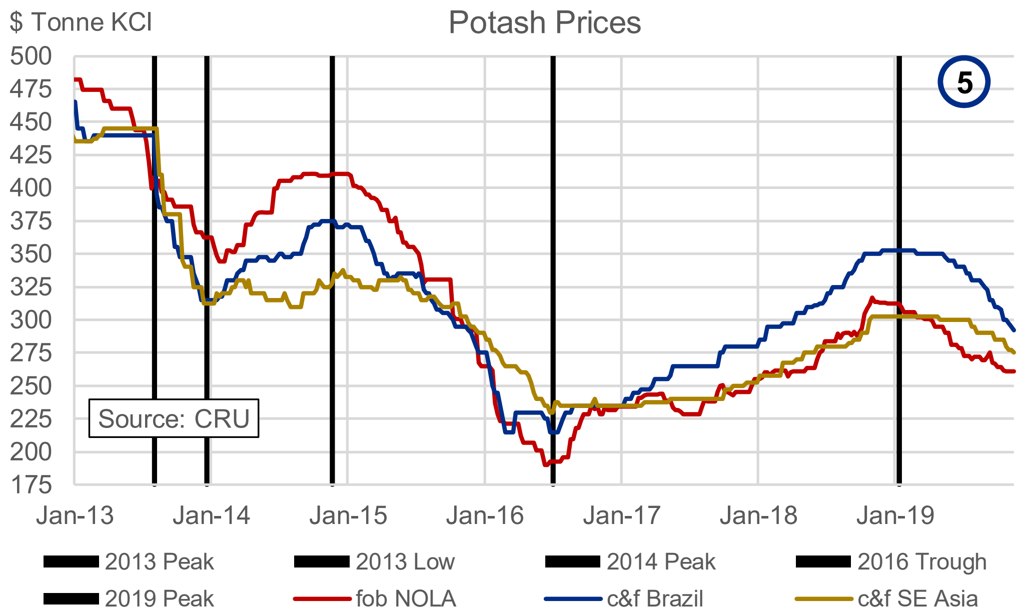


4 Drivers of the 2016-18 Recovery

1. Strong and broad-based shipment growth following the destocking of channel inventories in 2015 and 2016.
2. Optimization of operations by producers who closed smaller high-cost facilities and ran larger low-cost facilities at steady and high rates.
3. A significant cumulative impact of production outages/changes (e.g. maximizing lithium output).
4. A much slower-than-expected ramp-up of large greenfield projects.

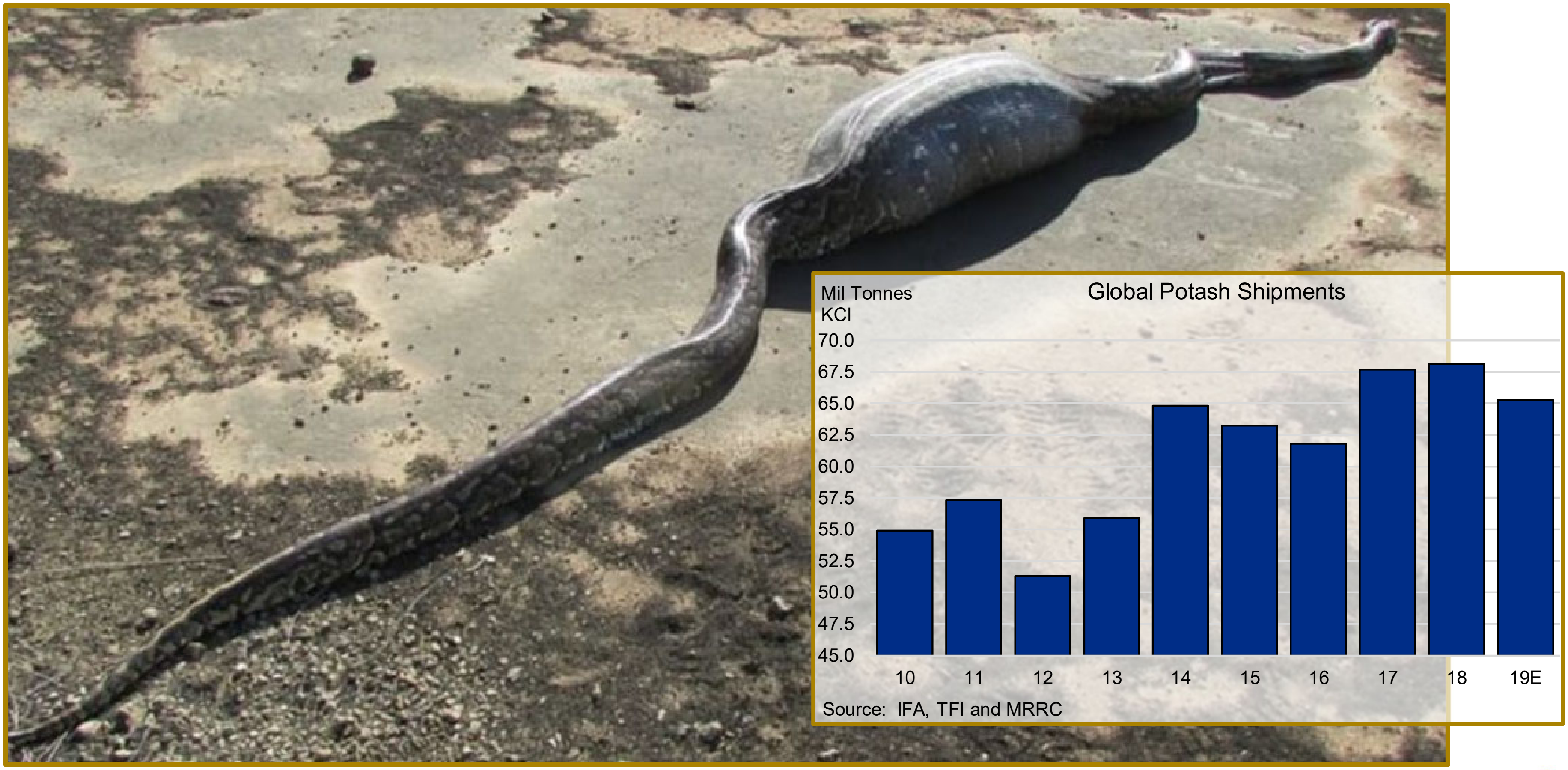
Handicapping Lessons Since 2013



⑤ 2019 Developments

1. Large channel inventory builds in key geographies following record-shattering shipments in 2017 and 2018 during the long price recovery.
2. Well-below-average U.S. 2018 fall and 2019 spring application seasons impact/defer demand.
3. Sluggish on-farm use due to lower prices for key potash-using crops as well as higher local currency potash costs resulting from weaker FX.
4. Record Canadian and Belarus production in 2018 plus the ramp-up of output by new entrants at new greenfield sites in Canada (K+S Bethune) and Russia (Eurochem Usolskiy).

Key Lesson: Where is the pig in the python?



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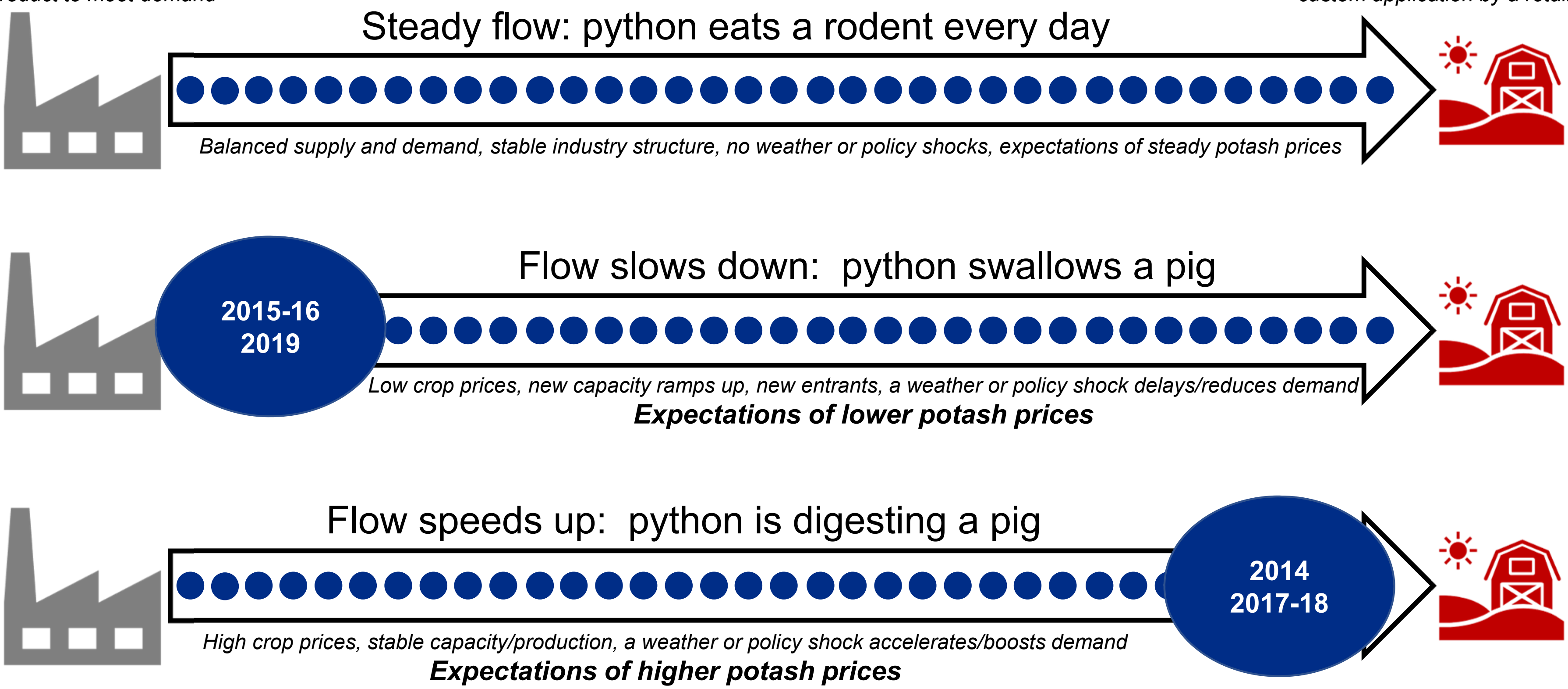
Key Lesson: Where is the pig in the python?

Potash mines and mills, often located long distances from end-user markets, operate 24-7-365 (or 330) to produce enough product to meet demand

A long and large supply chain

Farmers typically apply potassium once during a short application window in the fall or spring, often via custom application by a retail dealer



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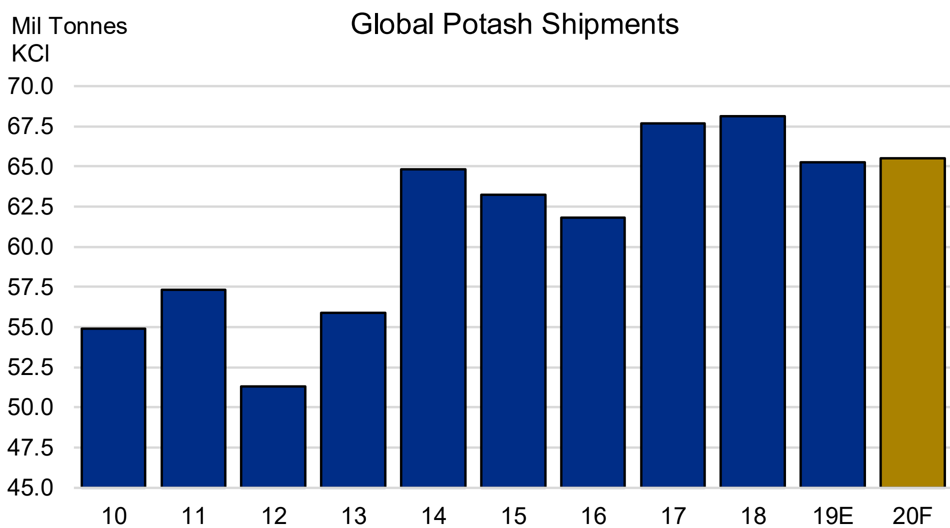
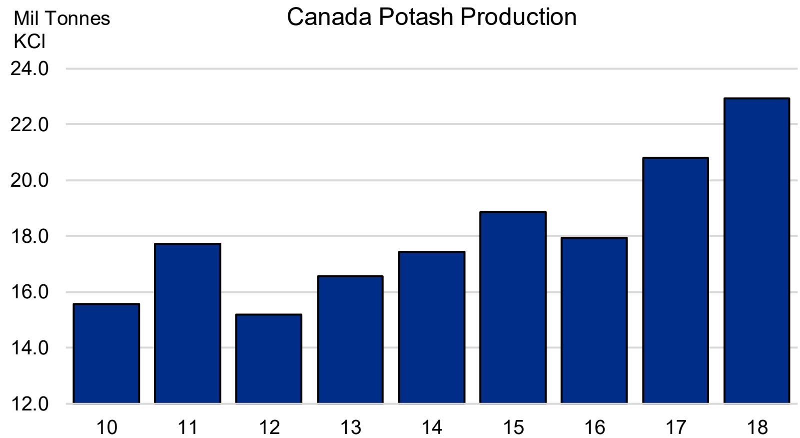
Global shipments will rebound less than expected in 2020



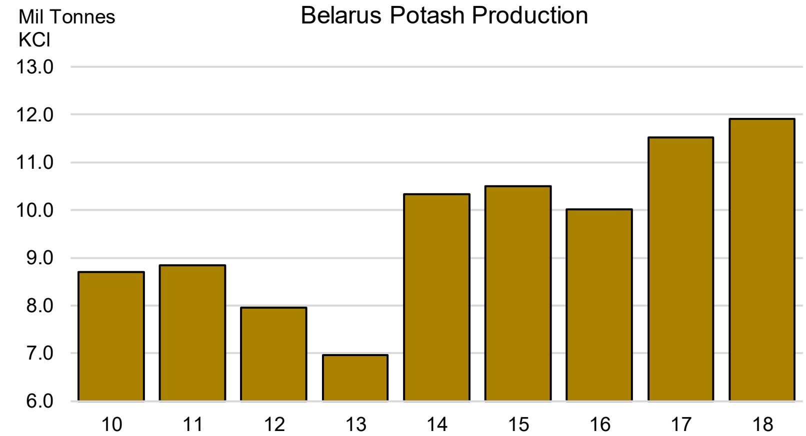
Source: IFA, TFI and MRRC

- Based on IFA and TFI statistics, global shipments jumped from 61.8 million tonnes in CY 2016 to 67.7 million in 2017 and to 68.1 million in 2018.
- Record shipments in both 2017 and 2018 resulted in a large build-up of channel inventories. Distributors with lean inventories at the end of 2016 positioned large quantities of product during the rising market. Production surged to record levels to meet strong buying interest.
- Shipments are expected to drop to ~65 million tonnes in 2019 due to modest on-farm demand increases and as distributors work down large inventories.
- Despite the significant drop in shipments this year, bears expect only flat to a small increase in shipments in 2020 due to continued sluggish on-farm demand, still elevated channel inventories in several regions, and no signs of a change in market sentiment/price expectations.

Producers especially in Canada and Belarus ran hard in 2017 and 2018 as distributors gobbled up tonnes



Source: IFA



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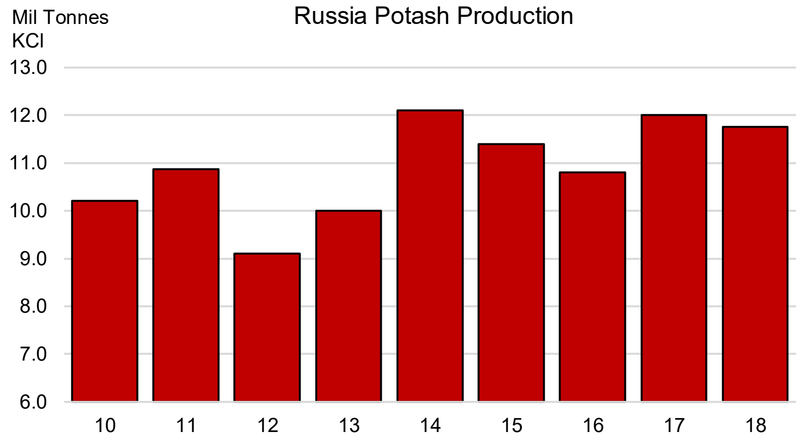

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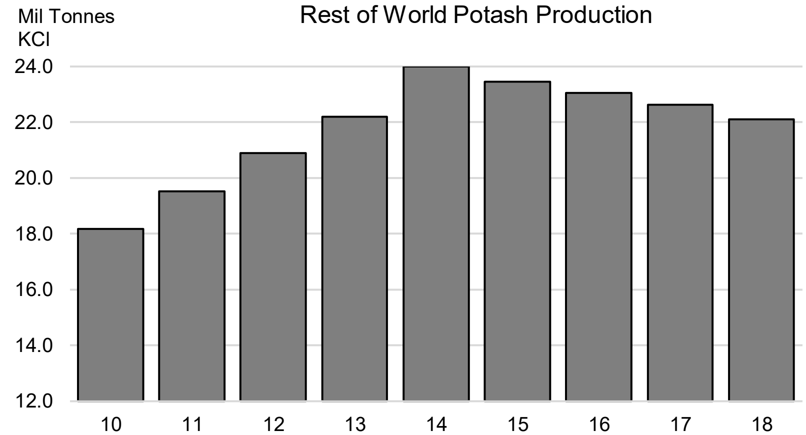
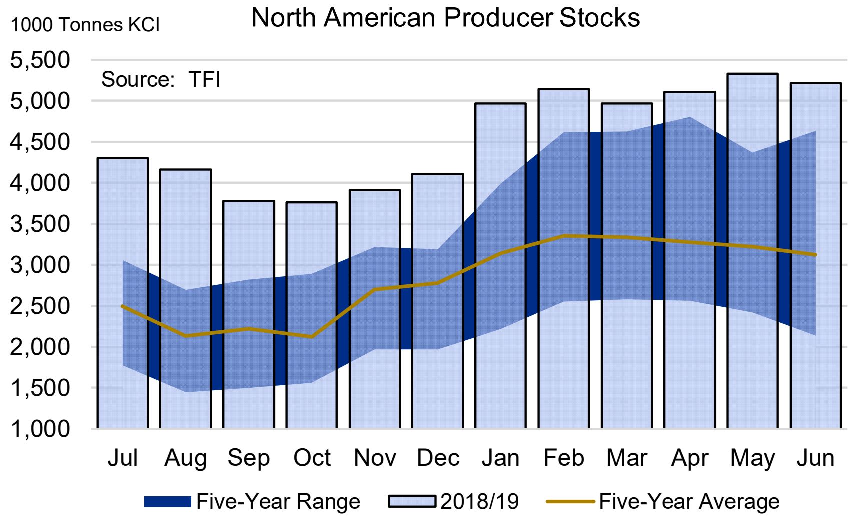
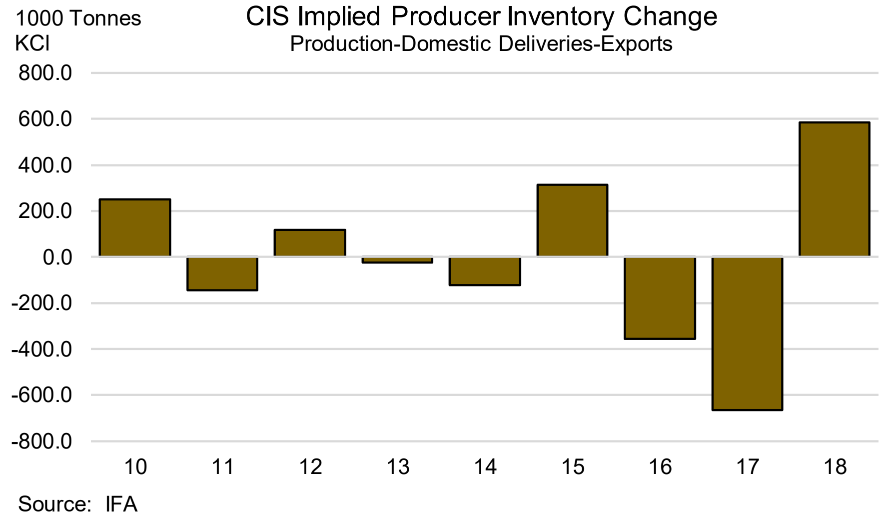


Source: IFA

MRRC

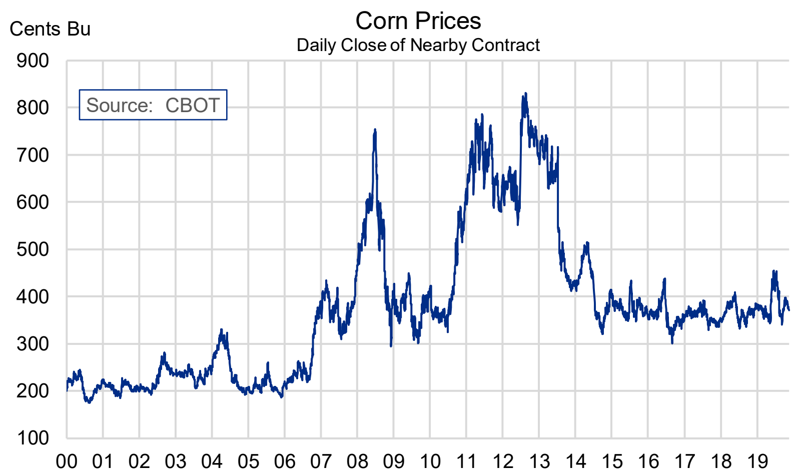
Producer stocks also climbed as shipments slowed and mines and mills kept running at high rates

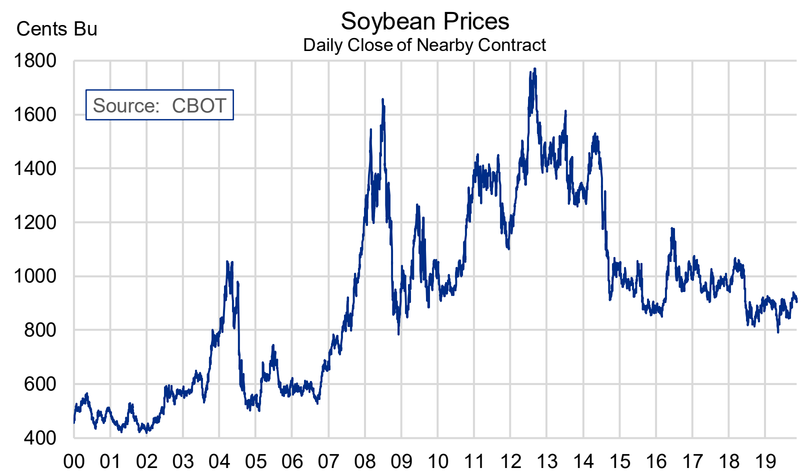


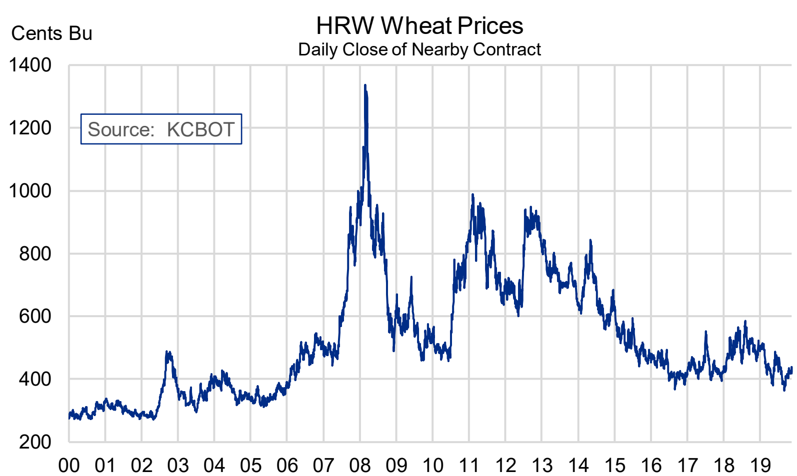


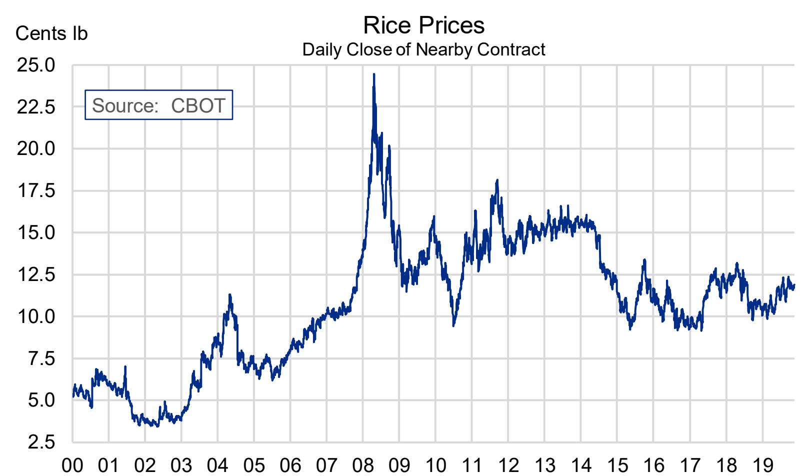
- North American producers (excluding K+S Bethune) reported holding a record 5.0+ million tonnes of inventory at both on- and off-site warehouses throughout the first half of 2019. Stocks at both domestic warehouses and Canpotex export terminals in Vancouver and Portland are included. The extremely late and disappointing domestic spring application season coupled with a slowdown in offshore sales resulted in no decline in inventories during Q2.
- The situation likely was not unique to North American producers. IFA statistics imply that CIS producers filled empty warehouses in 2018. Full warehouses finally caused many producers to scale back operations during the second half of 2019.
- Bears characterize some of the cutbacks as just bringing forward normal mine and mill maintenance and expect that excess supplies will continue to overhang the market in 2020.

Cautious on-farm demand outlook due to low crop prices









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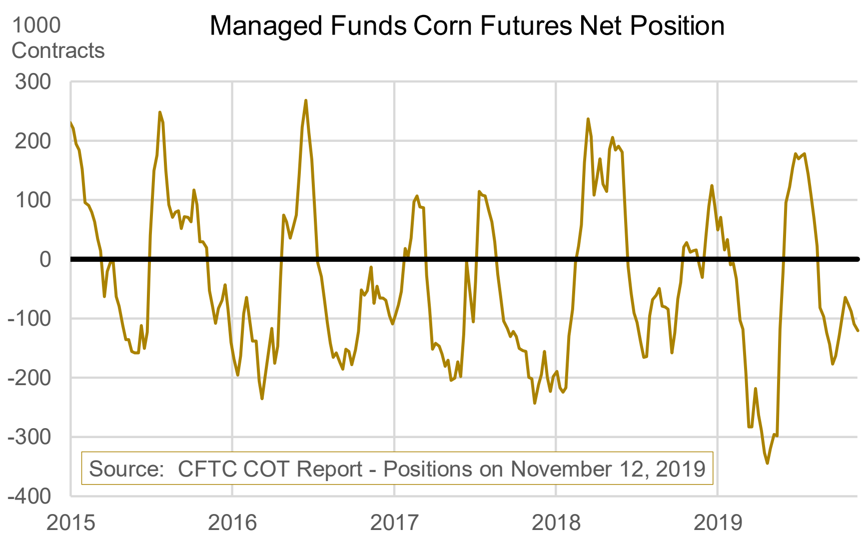
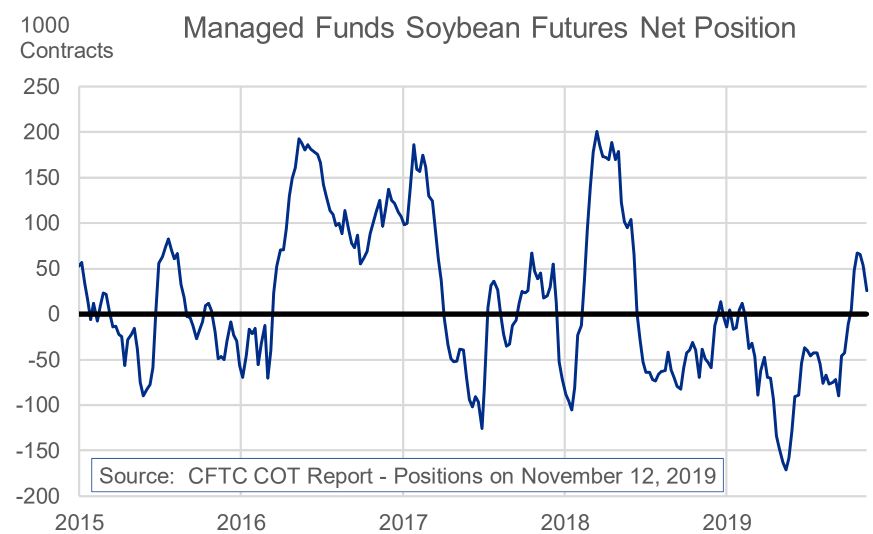
Smart money is betting on a big U.S. corn crop/weak corn demand but taking note of tighter soybean fundamentals





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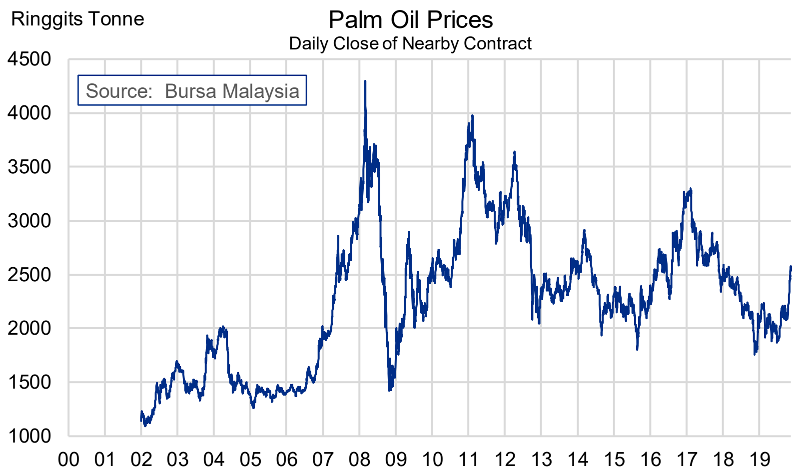
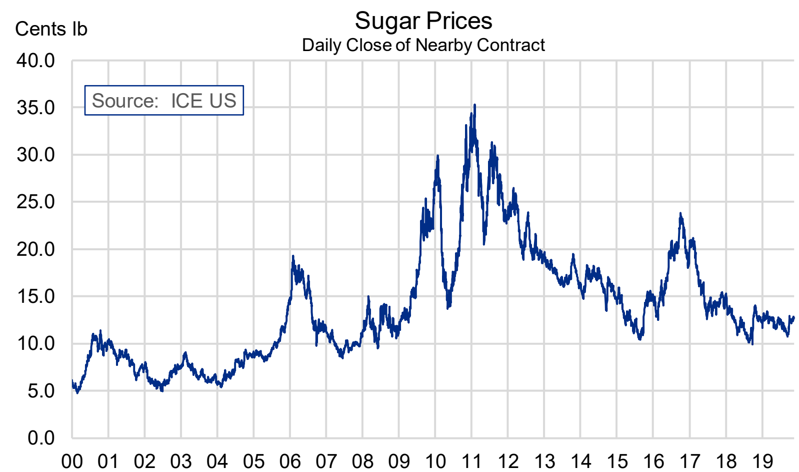
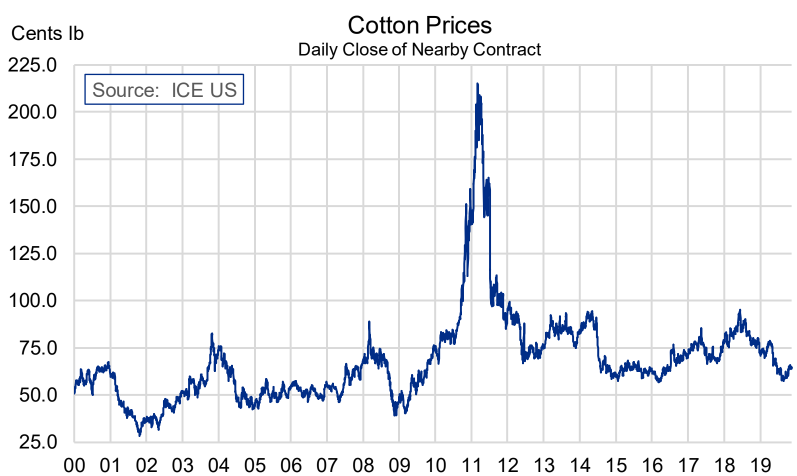
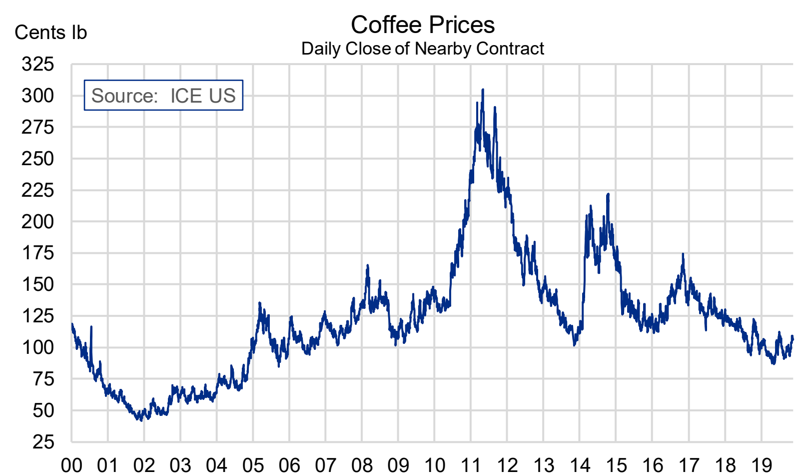
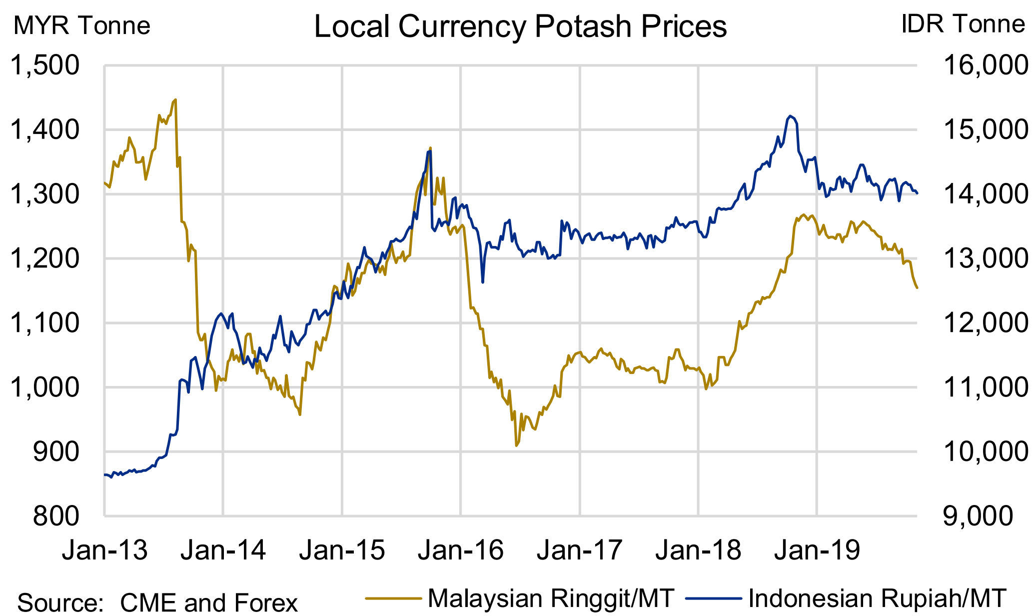








Weaker currencies in some importing countries have offset much of the decline in potash prices this year



Source: CME and Forex

And I still can’t get to 95+ million U.S. corn acres in 2020

U.S. Corn Supply/Demand Balance Sheet | **2019/20 Price Scenarios** | **2020 Acreage Scenarios**

	USDA WASDE November 8, 2019					MRRC 2019/20			MRRC 2020/21		
Million Bushels Unless Noted	15/16	16/17	17/18	18/19	19/20	Bull	Likely	Bear	Bull	Likely	Bear
Acreage and Yield											
Planted (mil acres)	88.0	94.0	90.2	89.1	89.9	89.9	89.9	89.9	94.2	88.2	85.2
Harvested (mil acres)	80.8	86.7	82.7	81.7	81.8	81.6	81.8	81.8	86.4	80.9	78.1
Harvested/Planted	91.7%	92.3%	91.8%	91.7%	91.0%	90.8%	91.0%	91.0%	91.7%	91.7%	91.7%
Yield (bu/acre)	168.4	174.6	176.6	176.4	167.0	166.0	167.0	168.0	167.0	175.8	180.1
Supply											
Beginning Stocks	1,731	1,737	2,293	2,140	2,114	2,114	2,114	2,114	1,629	1,848	2,005
Production	13,602	15,148	14,609	14,420	13,661	13,549	13,668	13,750	14,426	14,217	14,070
Imports	68	57	36	28	50	40	40	40	30	35	40
Total	**15,401**	**16,942**	**16,939**	**16,588**	**15,825**	**15,704**	**15,823**	**15,905**	**16,085**	**16,100**	**16,115**
Demand											
Feed and Residual	5,118	5,470	5,304	5,618	5,275	5,350	5,300	5,275	5,450	5,425	5,400
Food/Industrial/Seed	6,647	6,885	7,057	6,791	6,790	6,825	6,800	6,775	6,935	6,875	6,815
Ethanol for Fuel	*5,224*	*5,432*	*5,605*	*5,376*	*5,375*	*5,400*	*5,375*	*5,350*	*5,500*	*5,450*	*5,400*
Other	*1,424*	*1,453*	*1,452*	*1,415*	*1,415*	*1,425*	*1,425*	*1,425*	*1,435*	*1,425*	*1,415*
Exports	1,899	2,294	2,438	2,065	1,850	1,900	1,875	1,850	2,100	2,000	1,900
Total	**13,664**	**14,649**	**14,798**	**14,474**	**13,915**	**14,075**	**13,975**	**13,900**	**14,485**	**14,300**	**14,115**
Ending Stocks	**1,737**	**2,293**	**2,140**	**2,114**	**1,910**	**1,629**	**1,848**	**2,005**	**1,600**	**1,800**	**2,000**
Stocks/Use Percentage	*12.7%*	*15.7%*	*14.5%*	*14.6%*	*13.7%*	*11.6%*	*13.2%*	*14.4%*	*11.0%*	*12.6%*	*14.2%*

Source: USDA and MRR Consulting

2020 acreage estimates are calculated in this “farming-with-spreadsheets” exercise. They reflect the acreage the market likely will bid for based on a target carryout, demand forecasts and +/- trend yield estimates. The market likely will bid for more acres to insure against a weather disaster. However, if the average yield is close to 2020 trend estimates, it is hard to get to 90+ million acres even with a decent rebound in demand.

Trend yield calculated from 2000-18 statistics is 175.8 bushels per acre. Trend excluding the extreme outlier for the drought-impacted yield in 2012 is 180.1. The bullish acreage scenario assumes a 2020 yield equal to the current 2019 below-trend estimate

Projected use assumes a hefty rebound from the low estimates for 2019/20. All of the main categories are expected to register meaningful increases.

The target carry-out assumes little change from 2019/20 projected ending inventories for three scenarios.

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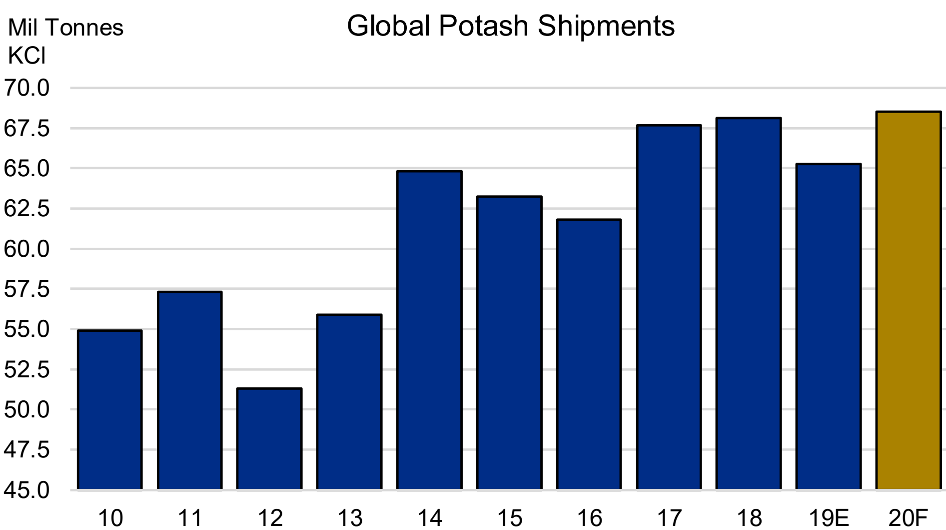
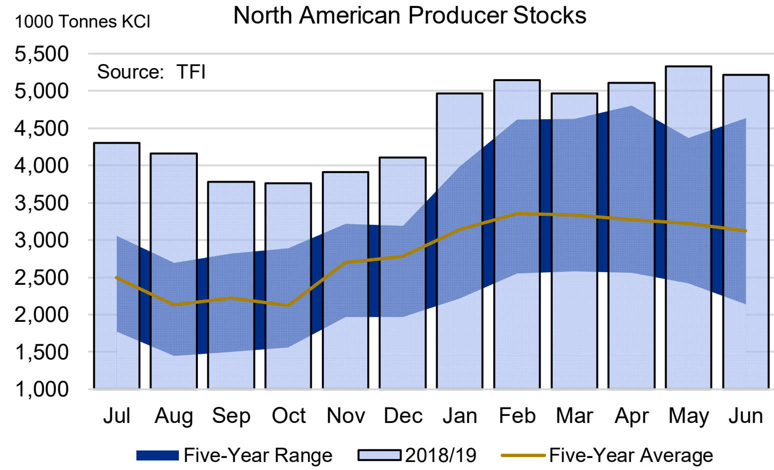


Source: IFA, TFI and MRRC

- The bullish scenario assumes that global shipments will rebound to a record 68-69 million tonnes KCl in 2020 due to a drawdown of both channel and producer inventories by the end of 2019 as well as positive on-farm demand prospects.
- Bulls point to the recent settlement of Indian contracts at a price slightly greater than expectations as evidence of strong on-farm demand following an outstanding monsoon as well as lean channel inventories.
- Bulls acknowledge record port inventories in China (3.7 million tonnes KCl at the end of October) but see scant stocks further down the distribution channel at NPK plants, bulk blending facilities and retail shops. Nevertheless, the market will live/survive without a Chinese contract settlement most likely until late Q1 2020.
- Bulls expect Indonesian and Malaysian importers will have big buying requirements following the sharp drop-off in imports this year and the recent surge in palm oil prices.
- Finally, bulls expect a strong rebound in North American on-farm use due to a recovery in U.S. planted area and still very much OK farm economics – and 2019/20 use likely will get bunched into the first half of 2020.

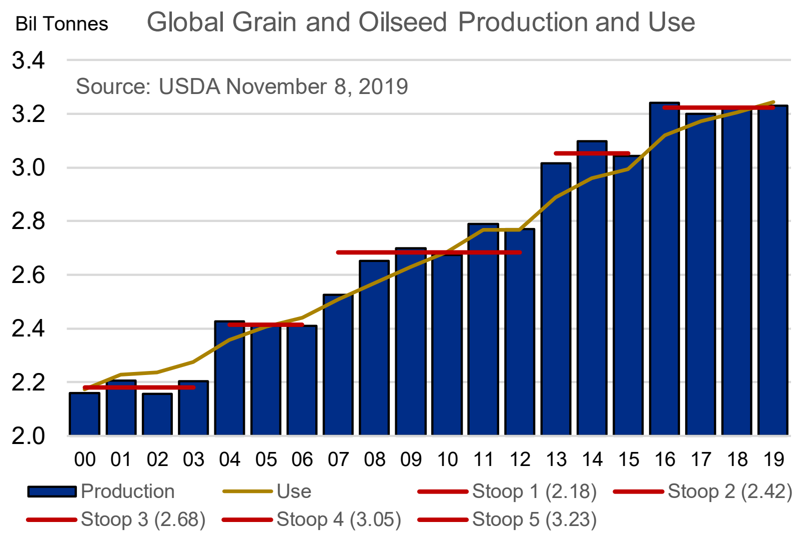
Producer stocks are expected to fall following cutbacks of 3.2-3.5 million tonnes KCl during the second half of 2019

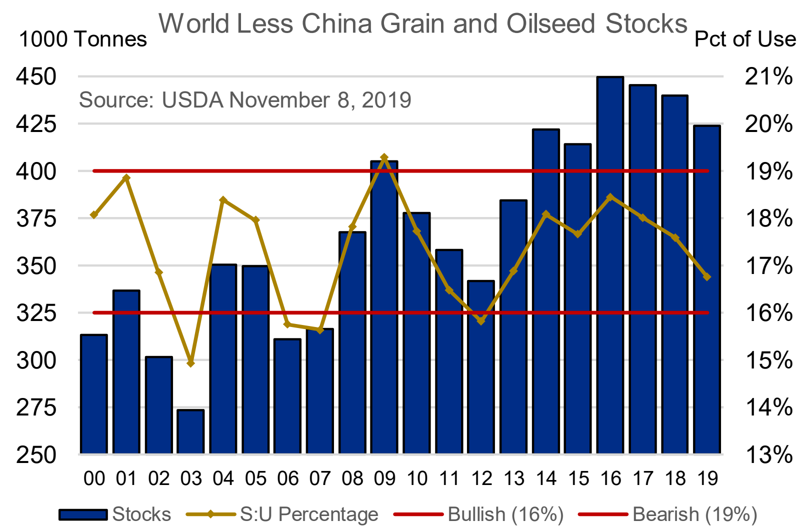
Potash Curtailments Second Half 2019		
1000 Tonnes KCl	Low	High
North America	1,800	1,800
Nutrien	700	700
Allan	*150*	*150*
Lanigan	*150*	*150*
Vanscoy	*400*	*400*
Mosaic	600	600
Colonsay	*400*	*400*
Esterhazy	*200*	*200*
K+S (Bethune + Zielitz)	500	500
CIS	1,250	1,500
Belaruskali	900	1,000
Uralkali	350	500
Mideast (ICL DSW)	180	200
Total	3,230	3,500



- North American producer stocks typically drop significantly during the third quarter as a result of normal turnaround schedules (maintenance is done during the summer rather than winter in Saskatchewan!) and strong seasonal shipments to both domestic and offshore customers.
- Harvest delays will narrow the fall application window in North America this year and likely push more domestic shipments from fall to spring.

Improving agricultural fundamentals . . .





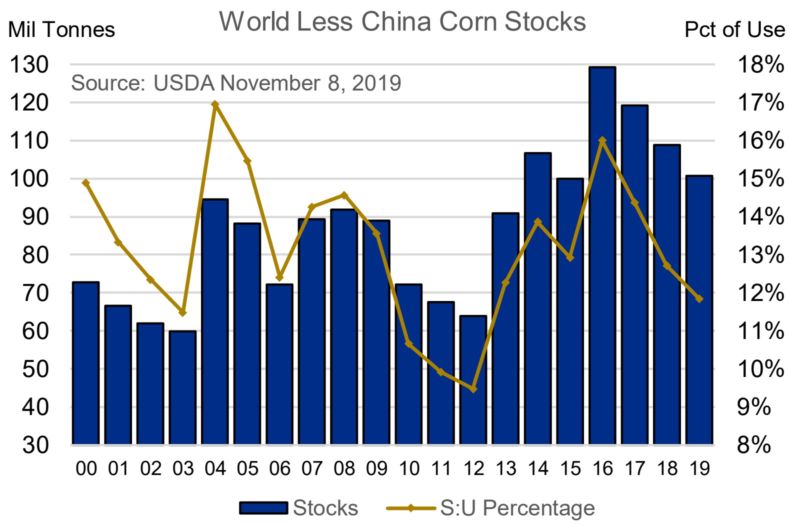
Global grain and oilseed use has increased at a compound annual growth rate of 2.2% since the turn of this century. Demand has advanced at a moderate and steady pace.

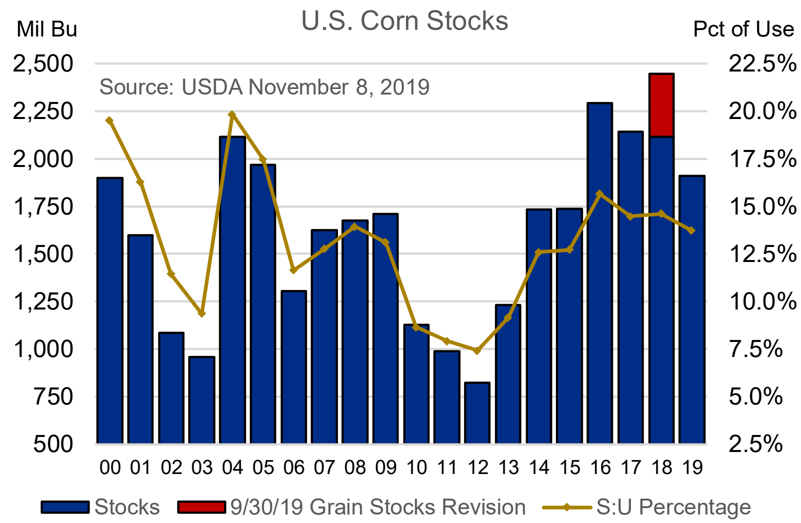
On the supply side of the ledger, global production of the 16 leading grain and oilseed crops also has increased at a compound annual growth rate of 2.2% during this period. However, gains have come in significant step-ups, especially following spikes in agricultural commodity prices in 2004, 2008 and 2012.

Stocks outside China provide a better read of grain and oilseed fundamentals in my view. The latest USDA estimates indicate that stocks are projected to drop 16 million in 2019/20. If this estimate is on target, inventories outside China will have declined 26 million tonnes since the end of the 2016/17 crop year.

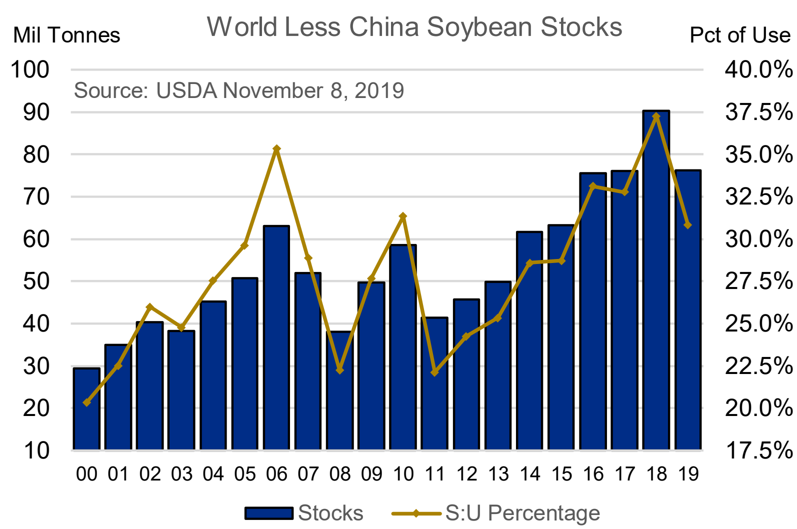
The stocks-to-use percentage dropped to 17.6% at the end of the 2018/19 crop year and is projected to decline to 16.8% by the end of 2019/20. That would rank as the lowest percentage since the 15.8% at the end of the 2012/13 crop year.

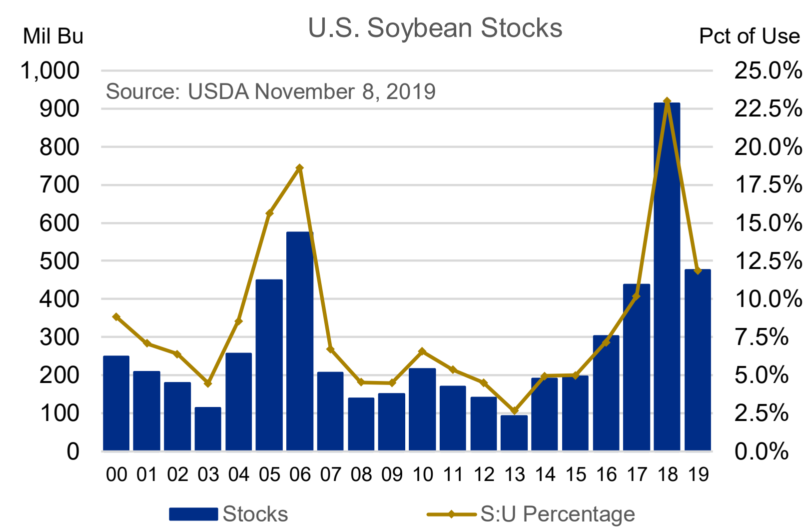
. . . especially for corn



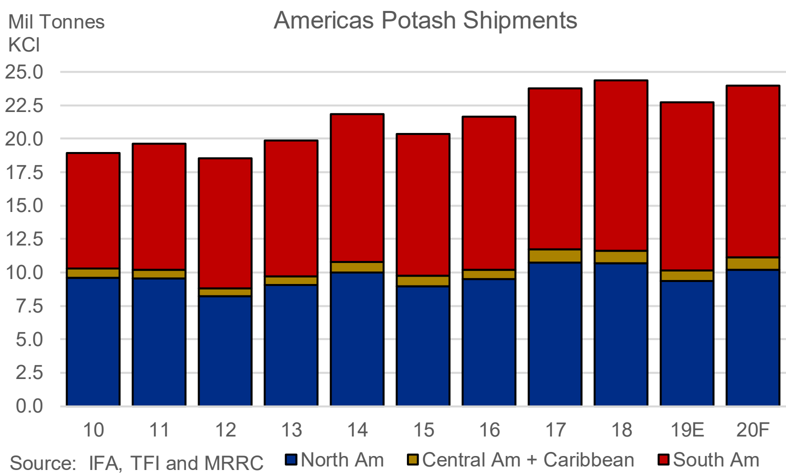


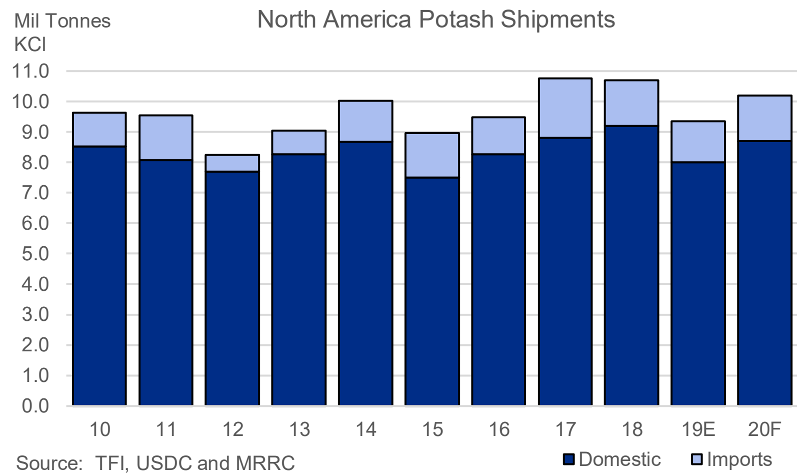
. . . but also for soybeans (even assuming another big Southern Hemisphere crop in 2020)

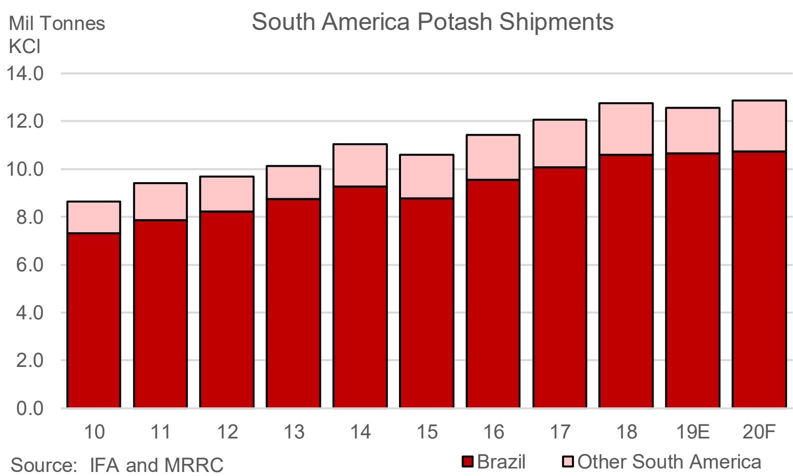




Americas Shipment Forecasts

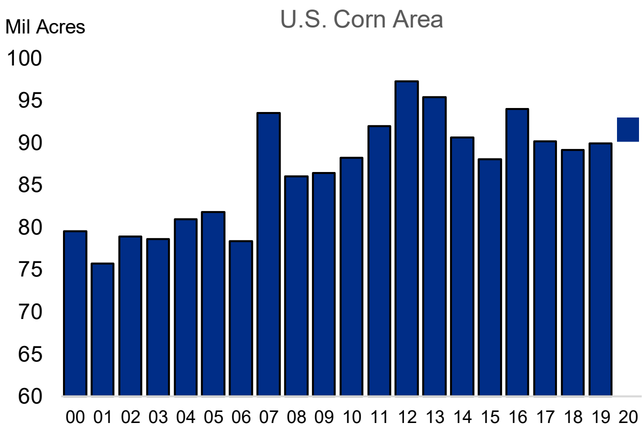




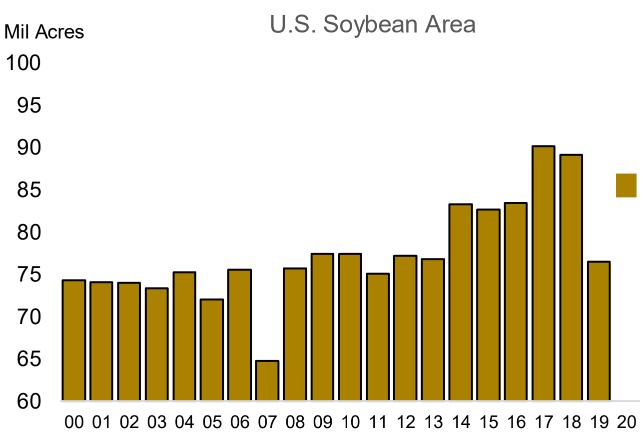


- Shipments to the Americas are projected to increase from an estimated 22.7 million tonnes KCl in CY 2019 to 24.0 million 2020.
- North America is projected to account for the bulk of the gain with shipments rebounding from 9.4 million this year to 10.2 million in 2020.
- A moderate increase is expected in Brazil with shipments forecast to climb from 10.6 million in 2019 to 10.8 million next year. Soybean and corn plantings are projected to increase another ~2.5% and ~5% to 36.8 and 18.4 million hectares, respectively.

U.S. demand expected to recover in 2019/20 driven by a rebound in planted acreage and OK farm economics



USDA November 8, 2019 and MRCC



USDA November 8, 2019 and MRCC

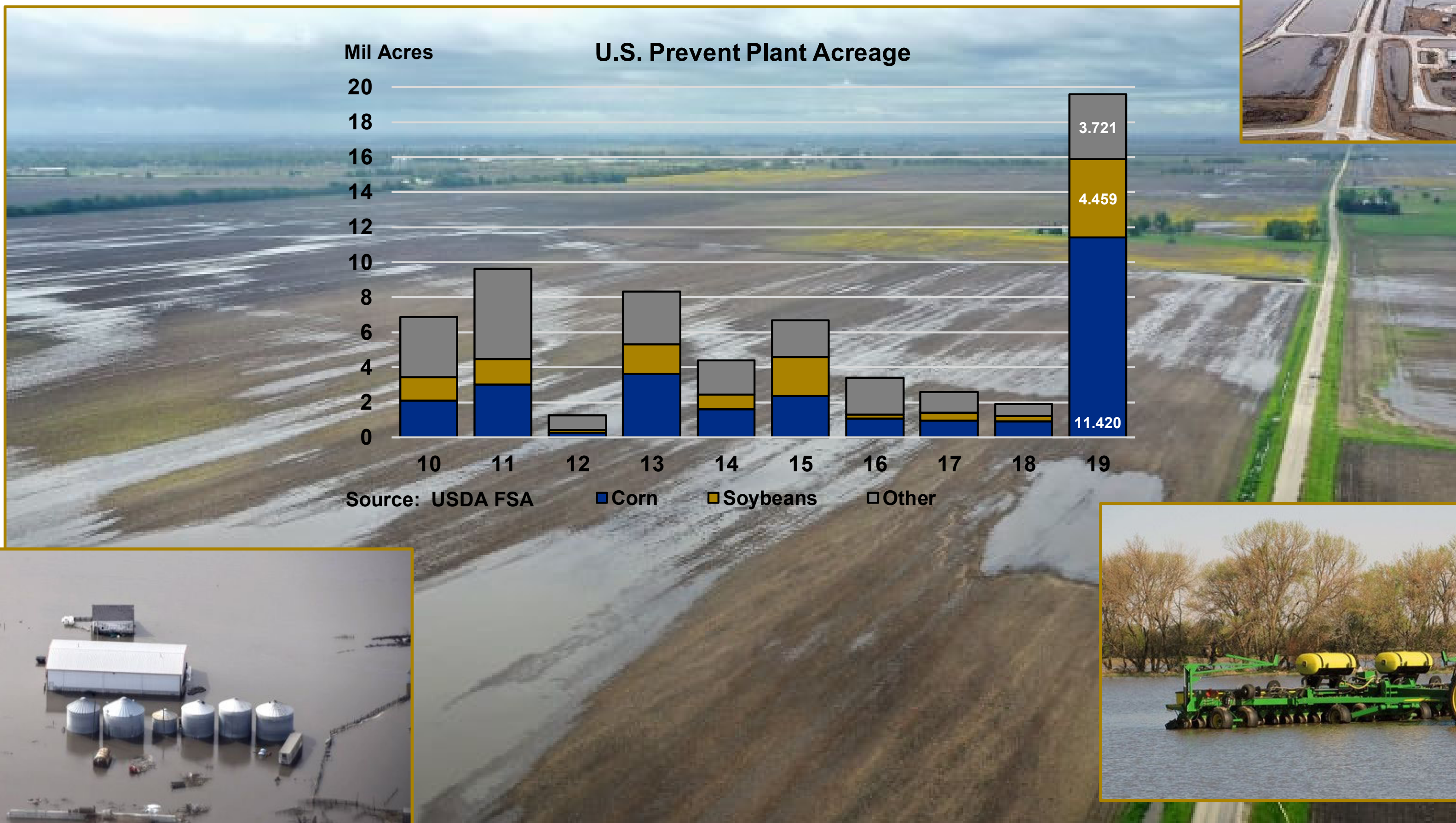
U.S. Corn, Soybean and Wheat Acreage

						2020	
Mil Acres	2015	2016	2017	2018	2019	Low	High
Corn	88.0	94.0	90.2	89.1	89.9	90.0	93.0
Soybeans	82.7	83.5	90.2	89.2	76.5	84.0	87.0
All Wheat	55.0	50.1	46.1	47.8	45.2	46.0	48.0
Total	225.7	227.6	226.4	226.1	211.6	220.0	228.0
Change		1.9	-1.2	-0.3	-14.6	8.4	16.4
Percentage Change		0.8%	-0.5%	-0.1%	-6.4%	4.0%	7.8%

- U.S. planted corn acreage is projected to increase to 90-93 million acres in 2020 due to a moderate drawdown of inventories in 2019/20 and an expected rebound in demand in 2020/21. Some analysts forecast that U.S. farmers will plant 95+ million acres next spring, but it is hard to stretch assumptions to get to that level in my view, especially based on current USDA and private 2019 crop estimates.
- U.S. soybean acreage is projected to rebound to 84-87 million acres in 2020 due to the sharp drawdown of inventories in 2019/20. Inventories are shrinking as a result of a much smaller 2019 crop and prospects for a rebound in exports to China. How much destocking will hinge on U.S.-China trade negotiations as well as the size of the Southern Hemisphere corp.
- After dropping nearly 15 million acres in 2019, U.S. corn, soybean and wheat acreage is expected to rebound 8 to 16 million acres in 2020.

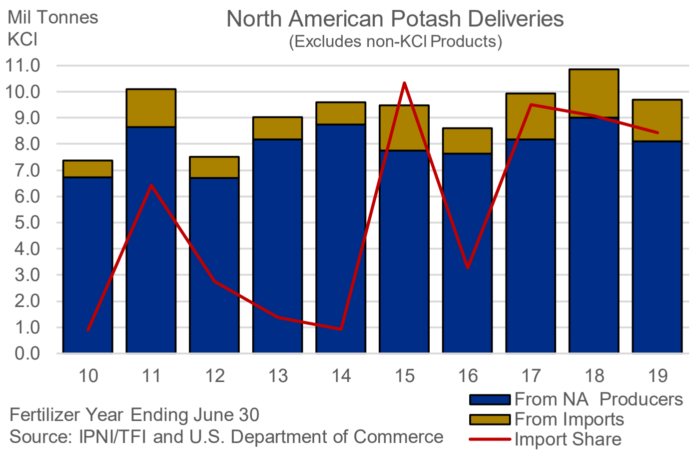
MRRC

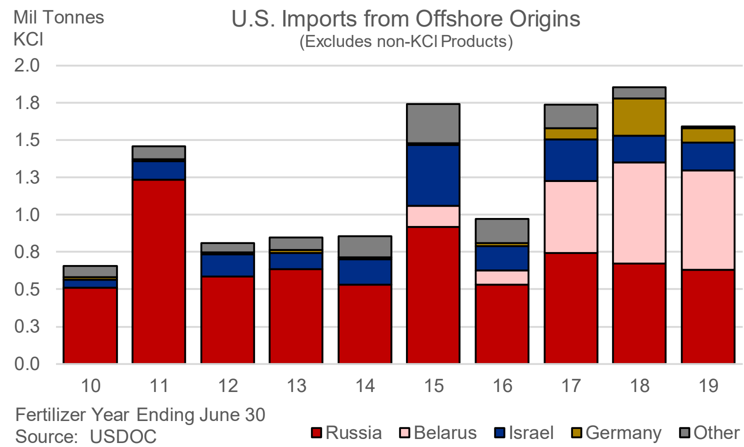
Record U.S. prevent plant acreage in 2019

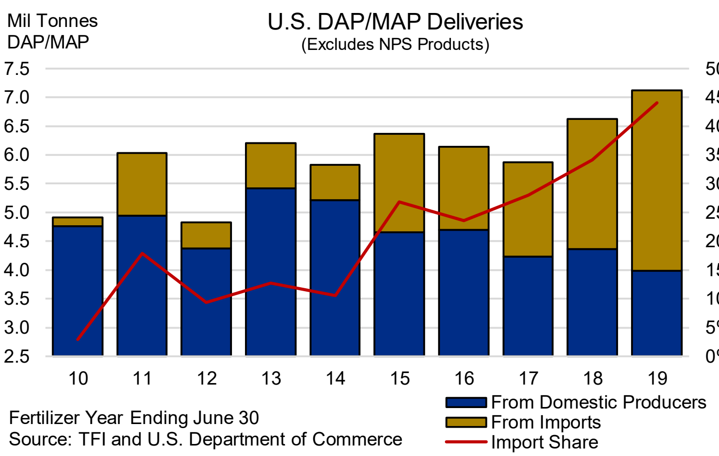


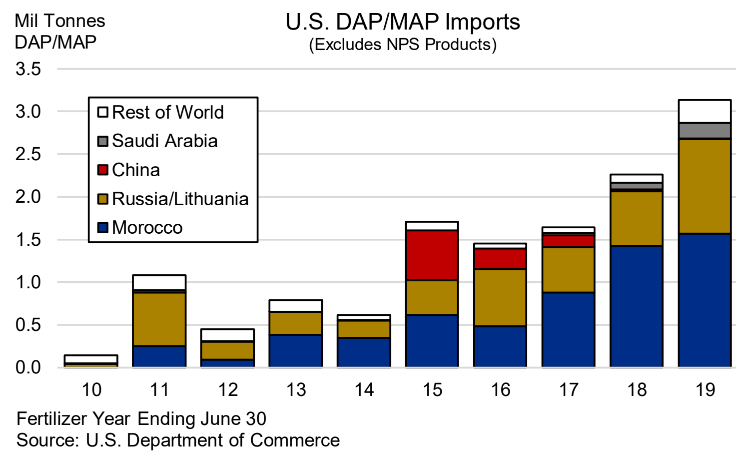
MRRC

Potash is not phosphate at least in North America









MRRC

A “little” help from MFP payments

Bil $	Total MFP Authorization	Tranche 1		Tranche 2		Tranch 3	
		Date	Payout	Date	Payout	Date	Payout
2018 MFP 1	9.57	18-Sep	4.70	18-Dec	4.87	na	na
2019 MFP 2	14.50	19-Aug	7.25	19-Nov	3.63	?	?
2020 MFP 3	?	?	?	?	?	?	?
Total	24.07		11.95		8.50		

Crop	MFP 1 Rate	Unit
Cotton	$0.06	$ lb
Corn	$0.01	$ bu
Dairy	$0.12	$ cwt
Hogs	$8.00	$ head
Sorghum	$0.86	$ bu
Soybeans	$1.65	$ bu
Wheat	$0.14	$ bu

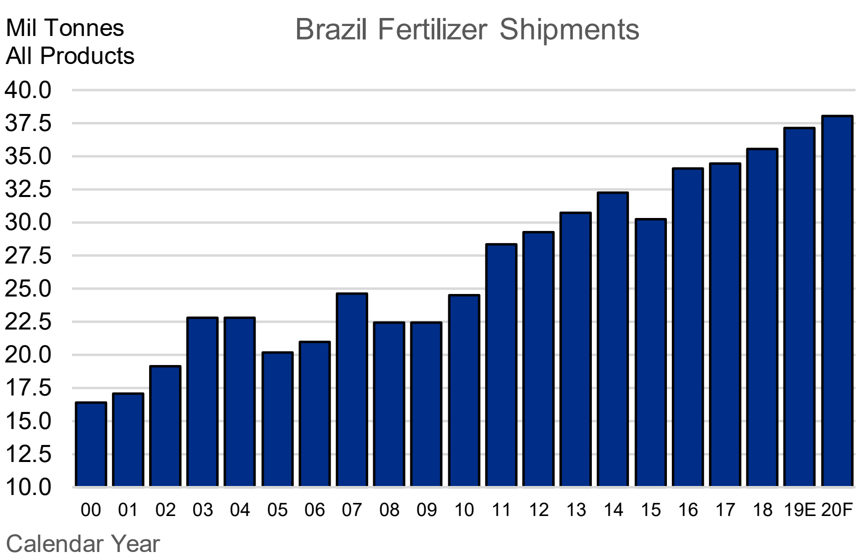
The Market Facilitation Program (MFP) provides direct payments to help farmers who have been impacted by illegal retaliatory tariffs, resulting in the loss of traditional exports.

The MFP is established under the statutory authority of the Commodity Credit Corporation (CCC) Charter Act and is under the administration of the U.S. Department of Agriculture (USDA) Farm Service Agency (FSA).

The MFP is one of three programs (the Food Purchase and Distribution Program (FPDP) and Agricultural Trade Promotion (ATP) are the other two) that are designed to offset the injury caused to the agricultural sector from the trade dispute with China. Total funding for these programs was authorized at $12 and $16 billion in 2018 and 2019, respectively. The MFP accounts for the lion’s share of the funding.

- The 2019 program (MFP 2) differed significantly from the 2018 program (MFP 1) in terms of how payments were calculated.
- MFP 1 based payments on total 2018 production times a commodity specific MFP rate (see table). The rate was determined based on the estimated loss resulting from the current trade dispute with China. Soybeans obviously were the commodity most impacted and received about 75% or $7.3 billion of the $9.6 billion payout in 2018.
- Given the complexity of MFP 1, the agency simplified how payments to crop producers were calculated for MFP 2. The payout was based on a single county payment rate times the total planted acreage of MFP-eligible crops in 2019. Rates are not dependent on crops planted and range from $15 to $150 per acre. Eligible planted acreage in 2019 could not exceed 2018 acreage, and like MFP 1, the program included payment limitations per person or legal entity.
- Payment rates for Kossuth IA, Champaign IL and Cleveland AR counties are $71, $82, and $134 per acre, respectively, in 2019.

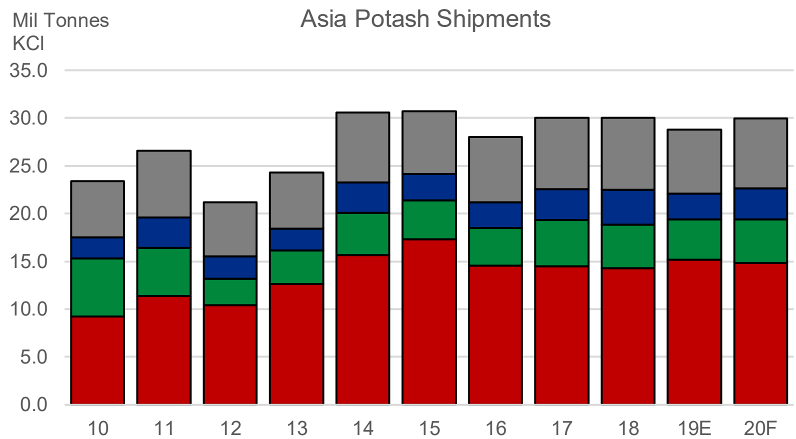
Brazil fertilizer shipments continue to march upward



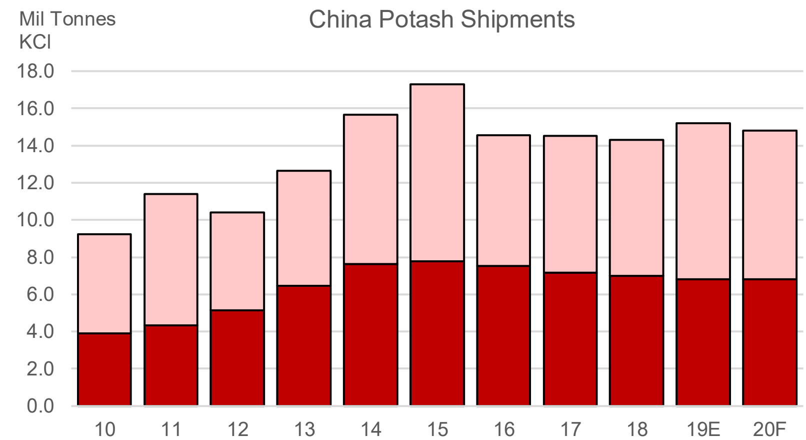
Source: ANDA and MRRC

- Brazil fertilizer shipments have increased at a CAGR of 4.4% since 2000. Shipments have more than doubled from 16.4 million tonnes in 2000 to 35.5 million in 2018.
- The most recent ANDA statistics show that shipments increased 7.1% during the first half of 2019. MRRC projects that shipments will increase 4.5% and breach the 37 million-tonne mark by year end. Brazilian demand is benefiting this year from the U.S.-China trade war, African Swine Fever (ASF) in China and generally favorable weather during the last three growing seasons.
- Shipments are forecast to increase 2.5% in 2020 and top 38 million tonnes. Continued expansion of soybean and safrinha corn area and profitable farm economics are the key demand drivers in 2020/21.

Asia Shipment Forecasts



Source: IFA and MRRC



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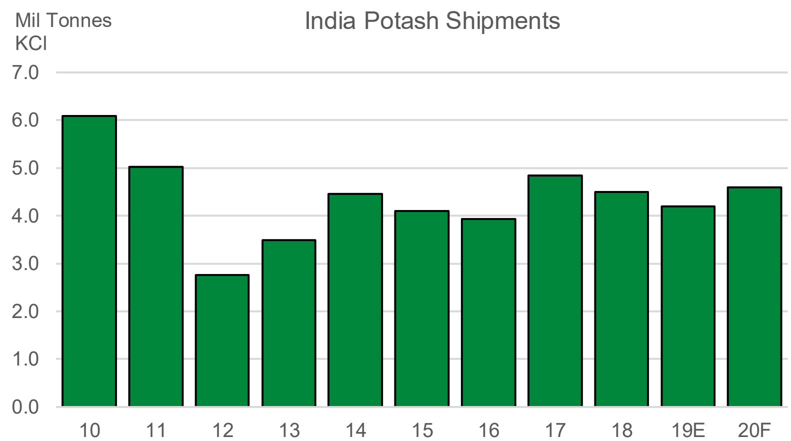

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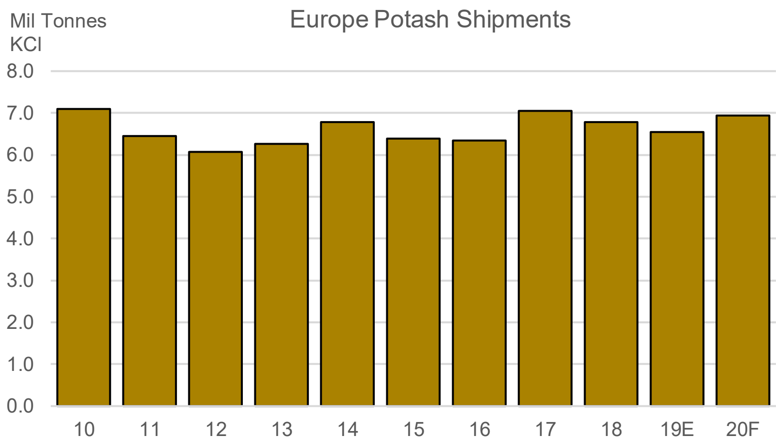
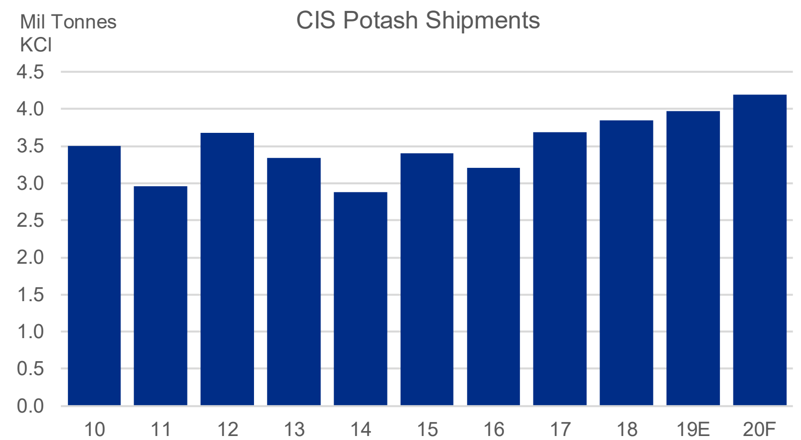
MRRC

Rest of World Shipment Forecasts



Source: IFA and MRRC



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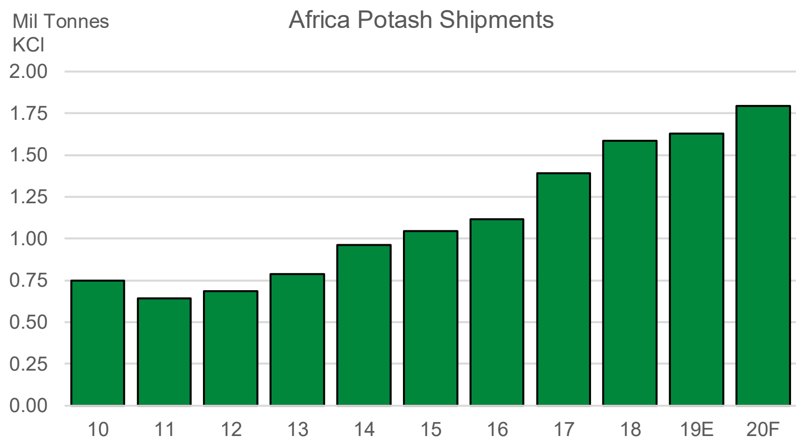

Source: IFA and MRRC

- Both CIS and Africa have registered impressive gains in potassium chloride (KCl) shipments from relatively low bases.
- In the case of Africa, much of the increase is through NPK use with Moroccan KCl imports showing big gains for the production of NPKs sold both in Africa and elsewhere. Some of the increase in CIS KCl shipments also is for NPK production that gets exported to other regions.

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New projects likely will start up later and ramp up more slowly than expected/advertised

Most analysts forecasted potash Armageddon due to the prospect of the start up of ~10.3 million tonnes of new greenfield capacity by three "new" entrants during the middle of this decade. Potash prices have softened but output from these projects has played a small role during the last half of this decade.

Country	Firm	Facility	Advertised Start-Up	First Production	Capacity	Estimated Production (MMT KCl) 2017	2018	2019	2020	*Comment*
Turkmenistan	Turkmenkhimija	Garlyk	2015	Mar-17	1.4	na	0.036	<0.1	<0.1	*Technical issues threaten viability. In legal dispute with contractors/construction companies.*
Canada	K+S	Bethune	Late 2015	Jun-17	2.0	<=0.5	~1.4	1.5-1.7	~1.8	*Still not making blend grade product. Off-spec product mostly sold to China NPK producers.*
Russia	EuroChem	Usolskiy	2016	Mar-18	2.3	0	~0.3	0.9-1.0	1.2-1.5	*Ramping up with a significant share of output going to internal NPK operations.*
		Volgakaliy	Late 2014	2018 Q4	4.6	0	<0.1	<0.1	0.0-0.9	*Test production in 2018 Q4 but ongoing start-up challenges due to geology and water inflow issues.*
Russia	Uralkali	Ust Yayva	2021	?	0.5	na	na	na	na	*Replacement mine for Berezniki 2 will result in a net add of one-half million tonnes.*
		Solikamsk 2	2021	?	1.2	na	na	na	na	*New shafts to replace the ones at this flooding mine. Start-up rumored to be pushed back a few years.*
	Acron	Talitsky	2023	?	2.0	na	na	na	na	*Slowly sinking shafts (reportedly one-third of way to the deposit in 2019 Q1). Unlikely 2023 start-up.*
Belarus	Belaruskali	Petrikov	2020	?	1.5	na	na	na	na	*Construction reportely began in 2014. Start up next year but expect slow ramp up at this greenfield site.*
	Slavkali	Lyuban	2022	?	1.8	na	na	na	na	*Start up pushed back to 2023 due to issues with groundwater.*
Spain	ICL	Suria	2021	?	0.3	na	na	na	na	*Net addition from closure of Sallent and expansion/optimization of Suria operations.*
Canada	Mosaic	Esterhazy 3	mid-2022	?	0.9	na	na	na	na	*Net add from move to new K3 mine from K1&K2. Transition expected complete by mid-2022.*
	BHP	Jansen Lake	?	?	4.4	na	na	na	na	*Mike Henry named new CEO effective January 1, 2020. More clarity about potash strategy expected.*
Total					22.9	<=0.5	~1.8	~2.5	~3.2	*Initial EuroChem output mostly to own NPK operations = Uralkali and Belaruskali market start-up tonnes.*
Incremantal Increase						<=0.5	~1.3	~0.7	~0.7	*Most of 2018 increase likely off-spec product to China.*

History suggest that the market shouldn't panic about the prospect of another 12-13 potential (and several unlikely) projects advertised for start up next decade – especially prices during the last five years.

Topics and Take-Aways

- Handicapping Lessons Since 2013
- The Bearish Scenario – The Downward Price Trend Continues
  - Global shipments will rebound less than expected in 2020
    - Still elevated channel inventories after record-shattering shipments in 2017-18 (plus high producer stocks even with recent “cutbacks”)
    - Cautious on-farm demand outlook due to continued low crop prices and a weak potash import currencies
    - And I still can’t get to 95+ million U.S. corn acres in 2020
  - New world-scale facilities will deliver bigger volumes and more blend-grade products in 2020
  - New entrants are creating a new competitive dynamic (the 4 Ps of commodity marketing)
- The Bullish Scenario – Prices Bottom and Then Move Up Moderately
  - Global shipments will rebound sharply in 2020
    - A major de-stocking of channel inventories in 2019 and producer stocks at lower levels following cutbacks in 2019 SH
    - Improving agricultural fundamentals expected to lift crop prices and underpin solid on-farm use
    - A poor U.S. fall season will bunch demand in 2020 and U.S. farmers are getting a “little” help from MFP payments
  - New projects will continue to start up later and ramp up more slowly than expected/advertised
  - Producers likely will continue to throttle back output if warehouses fill up
- My Handicaps

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40%

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Thank You!

2020 Potash Outlook

Handicapping the Scenarios

TFI Outlook Conference
Savannah, GA
November 20, 2019

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