

Phosphate Supply/Demand Outlook

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Safe Harbor

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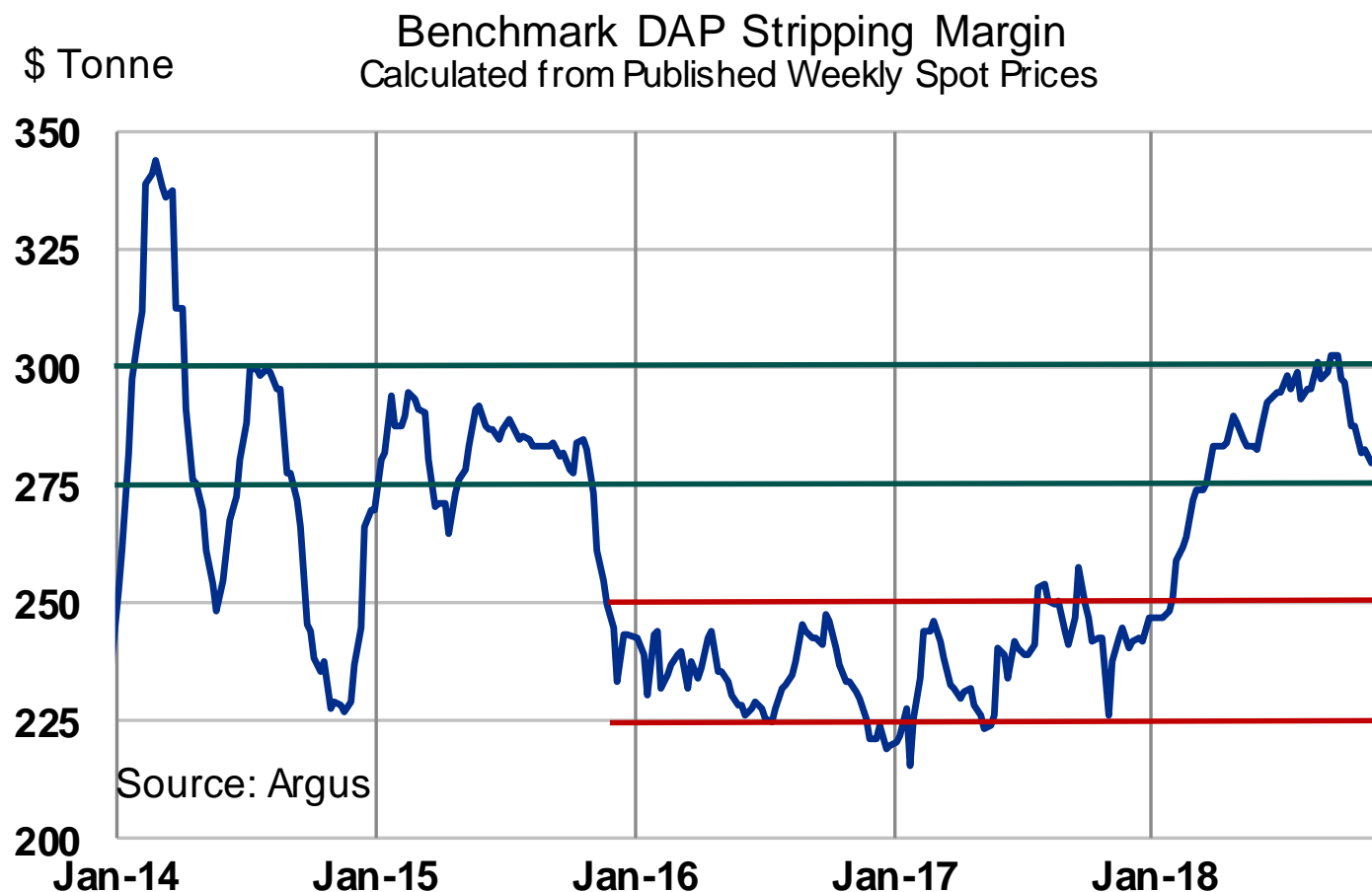
Topics

- A Look Back
- A Look Ahead
- Factors to Watch

A Look Back



Margins have moved up during the last year



- The benchmark DAP margin increased \$77 per tonne from November 2, 2017 to September 20, 2018.
- Normal seasonal factors have pressured margins in Q4, but margins have declined during this quarter in each of the last five years.
- Margins typically rebound in Q1 also due to seasonal factors.

	Change Q4-Q3 Average	Times <0	Change Q1-Q4 Average	Times >0
\$ Tonne				
2013-17 (Q4=OND*)	-\$24	5	\$29	4
2013-17 (Q4=NDJ*)	-\$15	5	\$28	4

*OND – October/November/December

*NDJ – November/December/January

We calculate a DAP benchmark stripping margin from published spot prices for DAP, sulphur and ammonia. It is a gauge that registers fundamental changes in the phosphate market over time and is not intended to approximate Mosaic's realized margins.

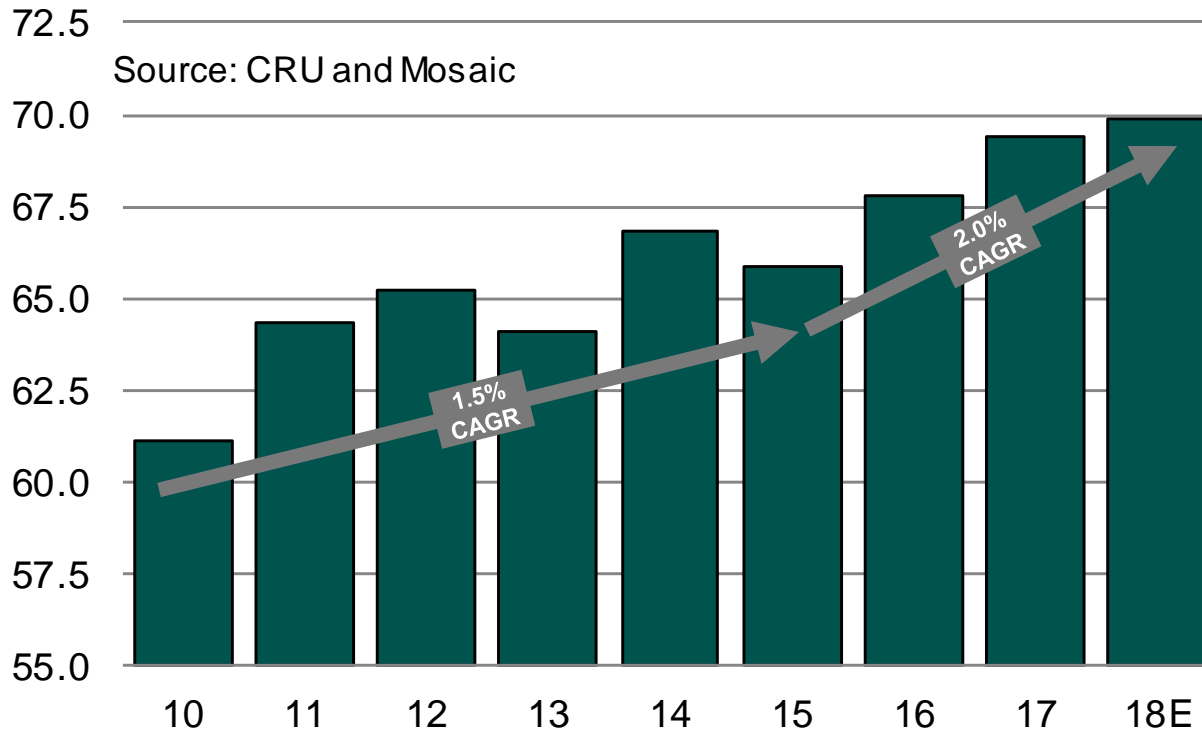
Several drivers of the recovery

- The pace of demand growth has picked up
 - Still a heavy drag from China
 - And a slow recovery in India
 - *But extraordinary and broad-based gains in the rest of the world*
- Three one-million-tonne-plus supply adjustments in 2018:
 - Temporary idling of Mosaic's Plant City facility
 - Slower-than-expected ramp up of projects in Morocco and Saudi Arabia
 - Lower Chinese exports due to new environmental taxes and regulations
- Raw materials cost pressure
- A shift in sentiment beginning in November 2017

The pace of demand growth has picked up

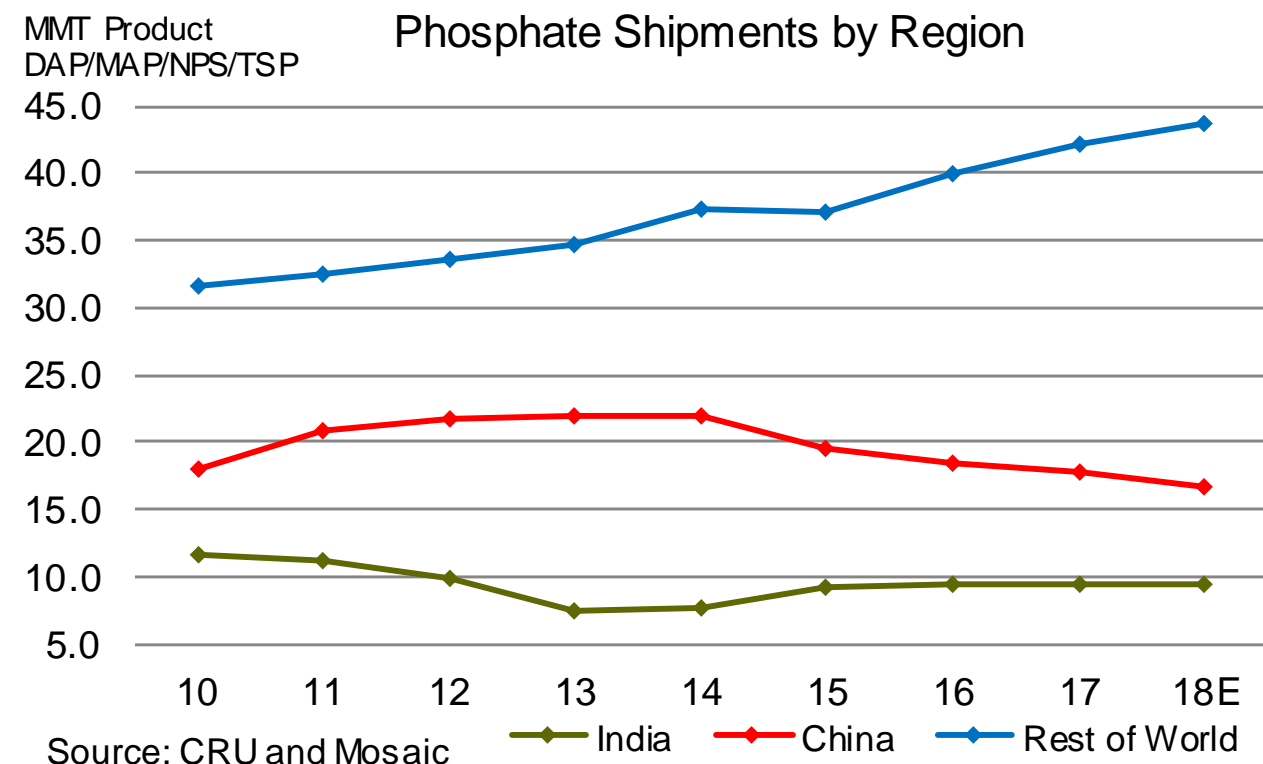
MMT Product
DAP/MAP/NPS/TSP

Global Phosphate Shipments



- Global shipments of the leading finished phosphate products increased 1.5% per year from 2010 to 2015, but the pace of growth has picked up to 2.0% per year since 2015.
- Shipments of the leading finished phosphate products increased 2.4% or 1.7 million tonnes to 69.4 million last year and are projected to increase 0.6% or 0.5 million to 69.9 million tonnes this year.
- Excluding China, demand increased 5.0% or 2.5 million tonnes in 2017. We project shipments outside China will increase 2.8% or 1.5 million tonnes this year.

Extraordinary gains outside China and India



- China and India are heavy drags on growth. Estimated shipments for 2018 are less than levels in 2010 for both of these large phosphate consuming countries.
- We project that Indian shipments will continue to recover slowly and Chinese shipments will stabilize at about 17 million tonnes.
- Demand elsewhere is extraordinary with shipments increasing at a CAGR of 3.4% from 2010 to 2015 and at the torrid rate of 5.6% per year during the last three years.

Supply Adjustment #1: Idling of Plant City

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Plant City Production

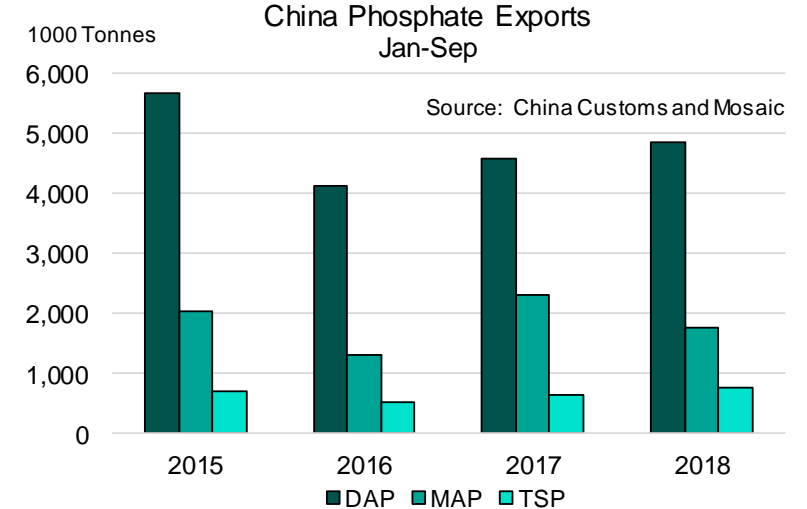
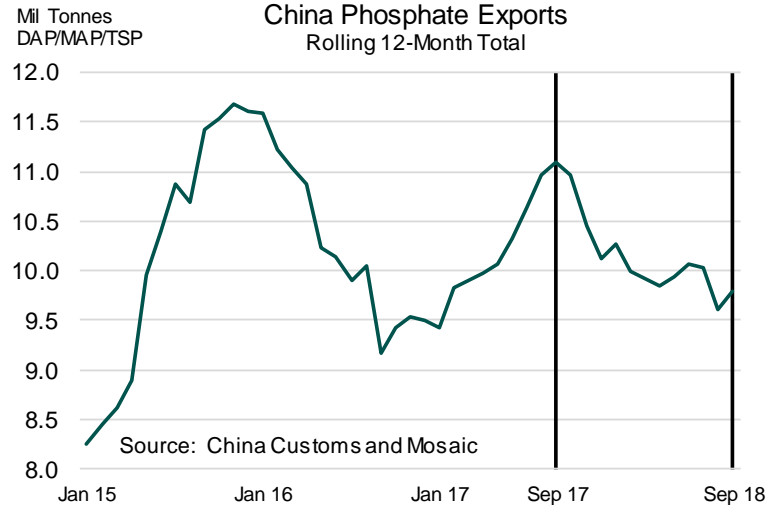
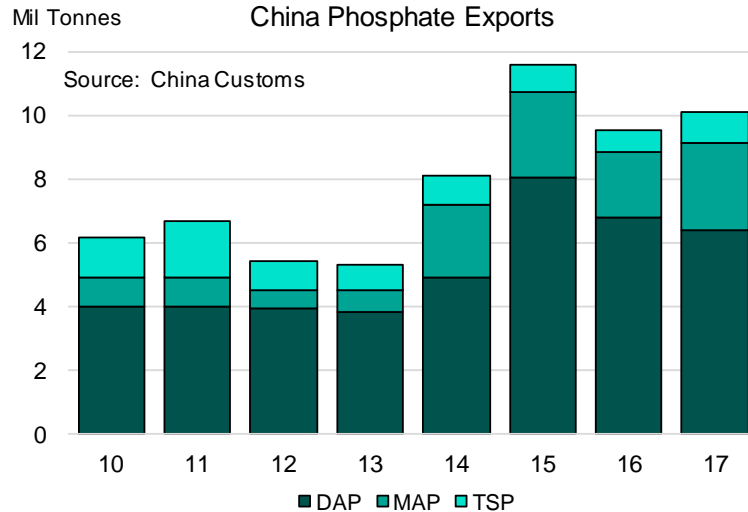
1000 Tonnes	2015	2016	2017
DAP	1,338	1,131	1,000
MAP	292	303	261
Total	1,630	1,434	1,261

- Mosaic announced that it planned to temporarily idle the Plant City facility for a minimum of one year in its October 31, 2017 earnings release and call.
- Production ended in early December 2017. The South Pasture mine that supplied most of the phosphate rock to the facility operated until the end of August and then also was temporarily idled.
- The status of the facility is under review, and a decision to re-start or continue to idle it in 2019 will be made by year end.

Supply Adjustment #2: Slower Ramp-Ups

- MWSPC JV
 - Produced 447,000 tonnes of DAP in 2017
 - Most expectations for 2018 likely were in the 2.0-2.5 million tonne range
 - We indicated that 1.5-1.7 million tonnes was a more realistic target
 - Output looks like it will be near the low end of this range this year
- JPH 3&4
 - Slower-than-expected ramp up of JPH 3
 - Later-than-expected start up of JPH 4
- Bottom line
 - *These projects likely delivered at least 1.0 million fewer tonnes than the market expected in 2018*

Supply Adjustment #3: Lower Chinese Exports

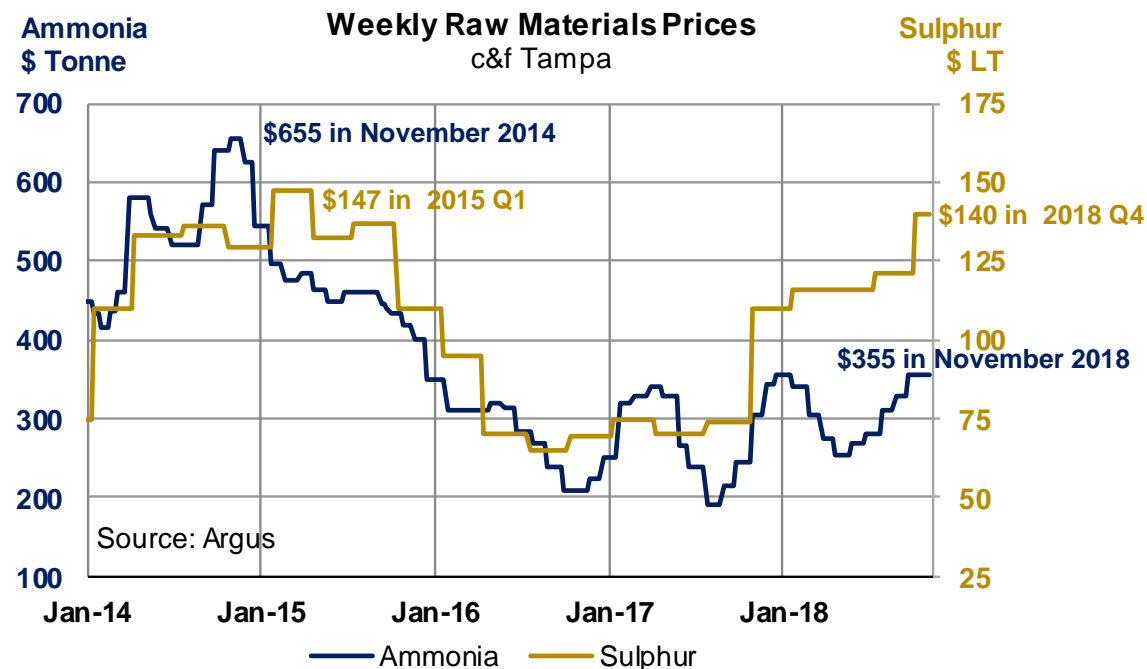
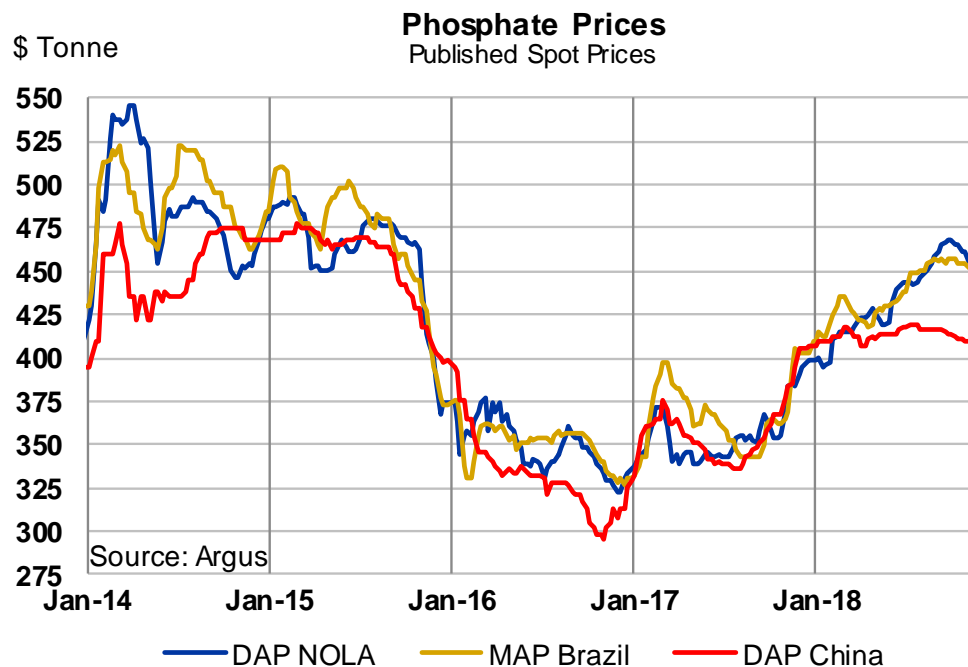


- Based on China Customs statistics and Mosaic estimates, Chinese phosphate exports during the first three quarters of this year likely were off about 2.5% or 190,000 tonnes from a year ago.
- However, the rolling 12-month total at the end of September was down 1.17 million tonnes from the same date a year earlier.
- MAP exports especially from non-integrated producers along the Yangtze river were impacted the most by higher rock and other raw materials costs, higher environmental taxes, and more stringent environmental regulations.

China Phosphate Exports						
1000 Tonnes	January-September				2018 vs. 2017	
	2015	2016	2017	2018	Change	Pct Chg
DAP	5,663	4,136	4,598	4,843	245	5.3%
MAP	2,031	1,324	2,300	1,770	-530	-23.0%
TSP	708	514	660	754	94	14.3%
Total	8,402	5,974	7,558	7,367	-191	-2.5%

Source: China Customs and Mosaic

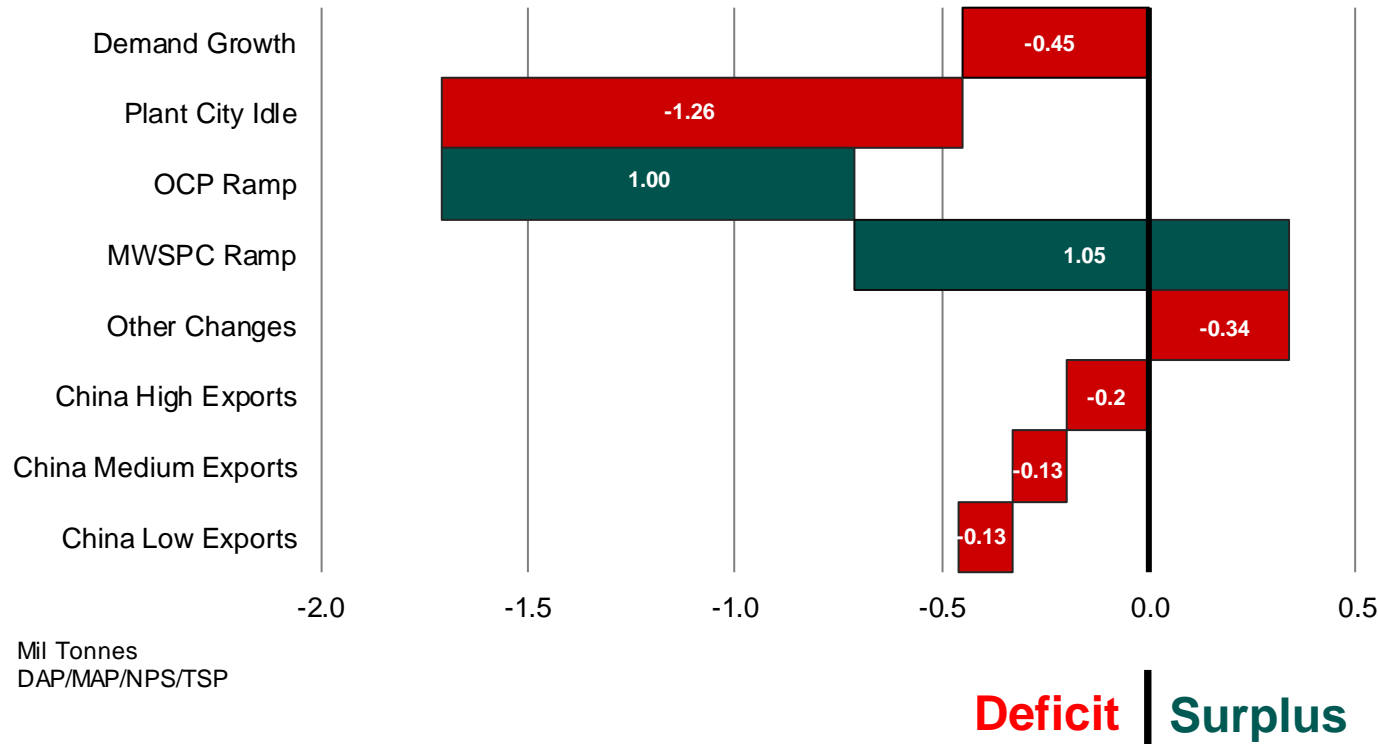
Raw materials cost pressure



- The cost of sulphur and ammonia per tonne of DAP today is more than \$50 greater than the cost one year ago.
- The price of sulphur c&f Tampa has increased from \$74 per long ton in 2017 Q3 to \$140 in 2018 Q4. A \$66 increase adds about \$26 to the cost of DAP.
- The price of ammonia c&f Tampa has increased from \$245 per tonne in October 2017 to \$355 in November 2018. A \$110 increase adds about \$25 to the cost of DAP.

Summary of 2018 Expected Changes

2018 Expected Phosphate Supply and Demand Changes



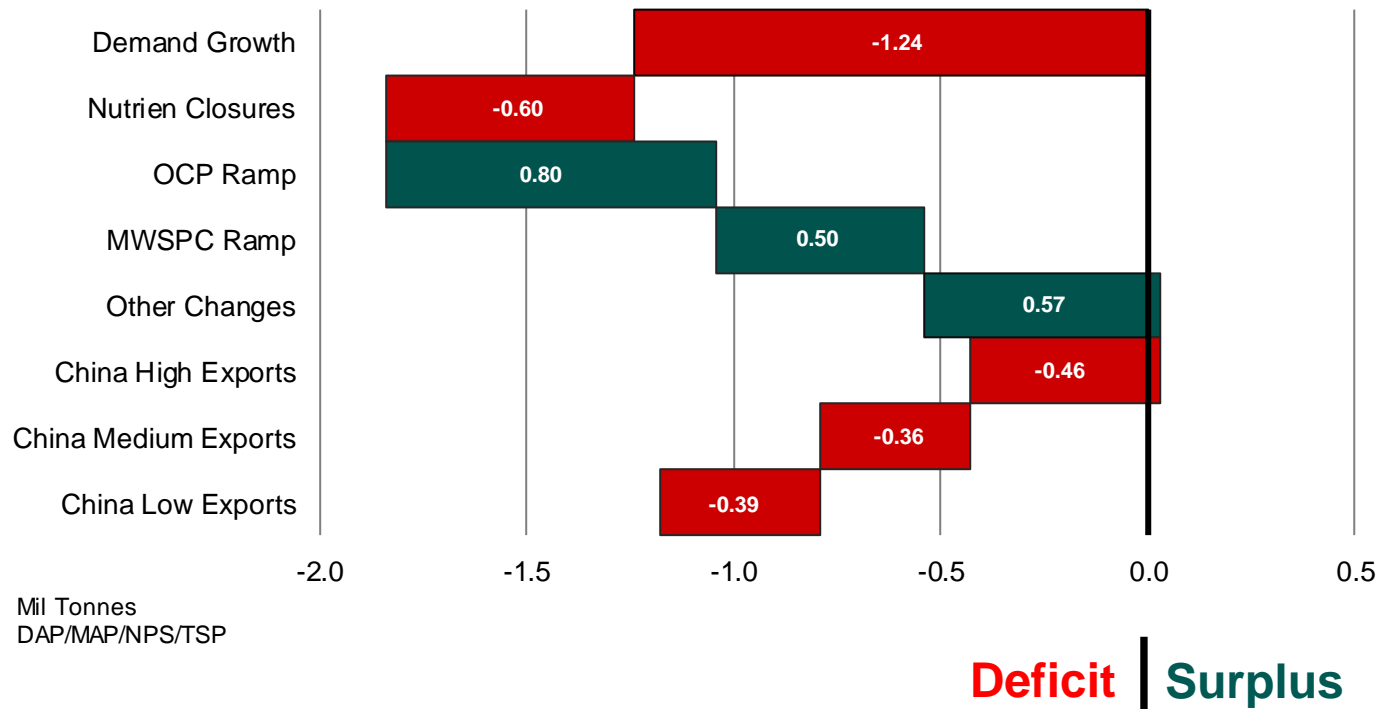
- Projected supply and demand changes this year resulted in a small deficit.
- A drawdown of channel inventories, a bit of demand destruction, and a boost in output from some producers are expected to close the deficit and clear the market this year.

A Look Ahead



Summary of 2019 Projected Changes

2019 Expected Phosphate Supply and Demand Changes



- Projected changes in supply and demand likely will result in another deficit in 2019, particularly if environmental regulations take hold and significantly reduce Chinese production and exports.
- We do not expect the world to run out of phosphate any time soon, but prices are expected to move to levels that will trim some demand and boost production elsewhere in order for the market to reach equilibrium next year.

Still Positive Demand Drivers

Strong Agronomic Need

Estimated World Grain & Oilseed Nutrient Removal

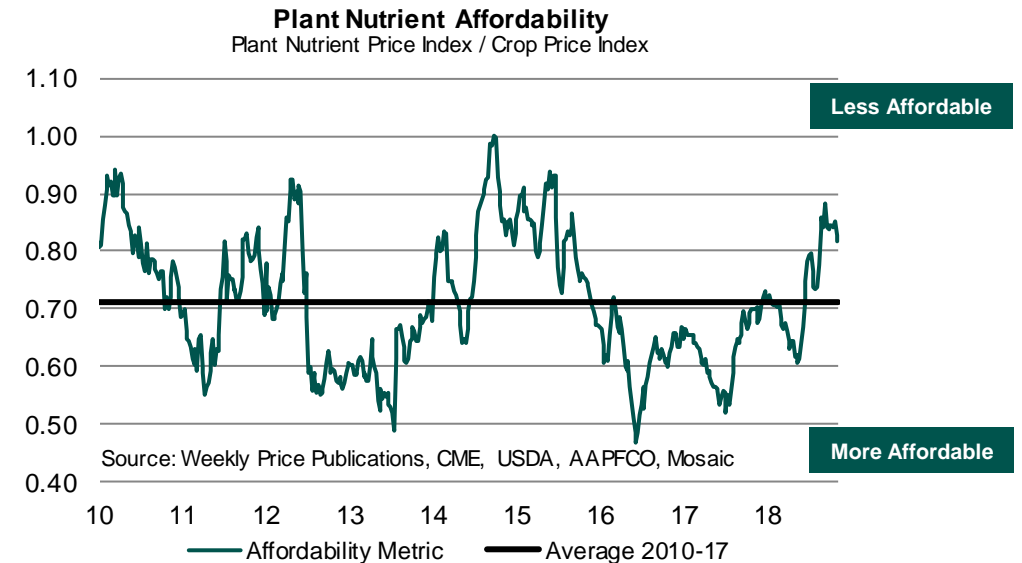
	2007-12 Stoop	2016-18 Stoop	Change	Percent Change
Mil Tonnes	(2.67 bmt)	(3.16 bmt)		
N Removal	57.7	69.2	11.5	19.9%
P ₂ O ₅ Removal	22.2	26.3	4.1	18.3%
K ₂ O Removal	18.7	22.4	3.7	19.8%

Source: USDA, IPNI, Mosaic

Record-shattering harvests have removed record amounts of phosphate from farm fields across the globe during the last few years. For example, the most recent step-up in grain and oilseed production (to 3.16 billion tonnes per year) removes 18% more phosphate than output at the 2007-12 stoop (of 2.67 billion tonnes per year). And this does not take into account the increases in the production of other crops such as fruits and vegetables.

Index	Current Week	Prior Week	Prior Month	Prior Year	Avg Since 2010
Ratio	0.82	0.83	0.85	0.70	0.71
Crop Price Index	168	166	167	161	214
Plant Nutrient Price Index	137	138	141	113	151

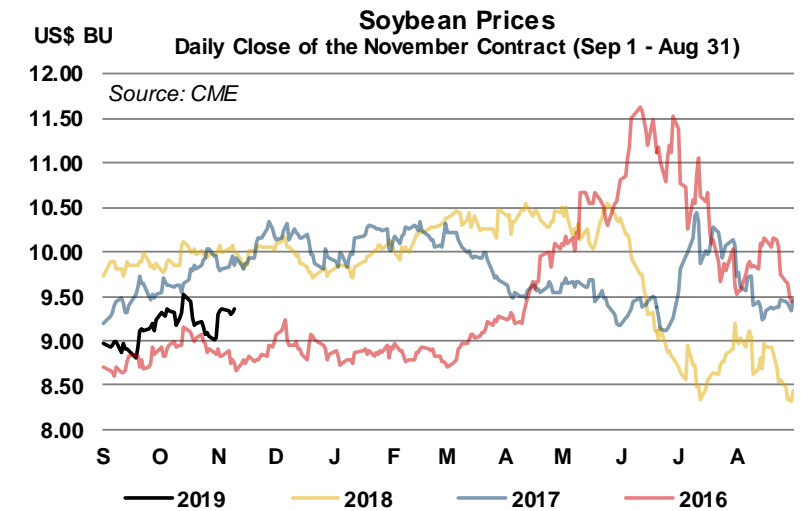
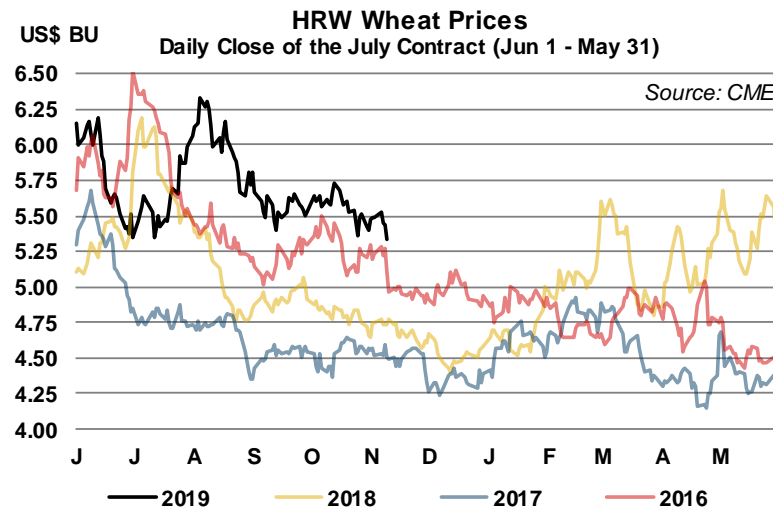
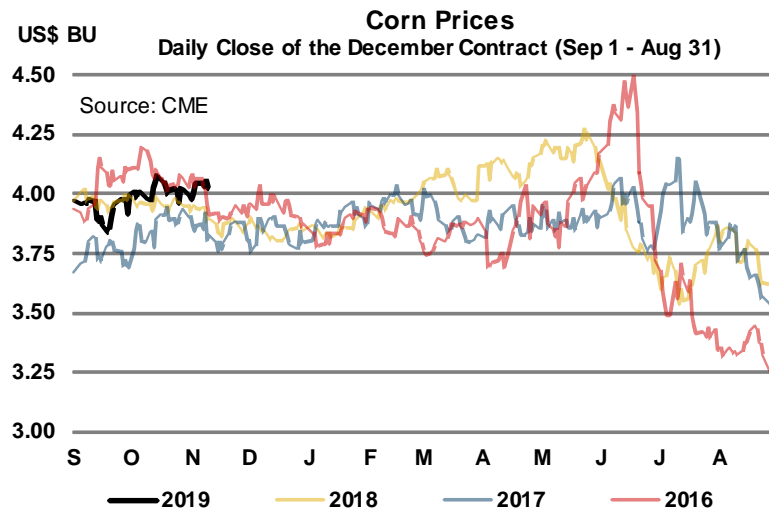
More Expensive But Still Affordable



Plant nutrients today are more expensive than the good buys of the last two years, but they remain affordable. Our affordability metric, the ratio of an index of plant nutrient spot prices and an index of nearby futures crop prices, registered 0.82 on November 8, above the 2010-18 average of .71 but below the 2014 peak of 1.00 and far below the 2008 peak of 1.54. Both crop and plant nutrient prices are below their 2010-18 averages, but plant nutrient prices have not declined as much as crop prices. The crop price index registered 168 on November 8, off 21% from the 2010-18 average of 214 while the plant nutrient index had fallen to 137, down 9% from the average of 151 for the same period.

Still Positive Demand Drivers

2019 new crop futures prices are about the same as those of the last three years

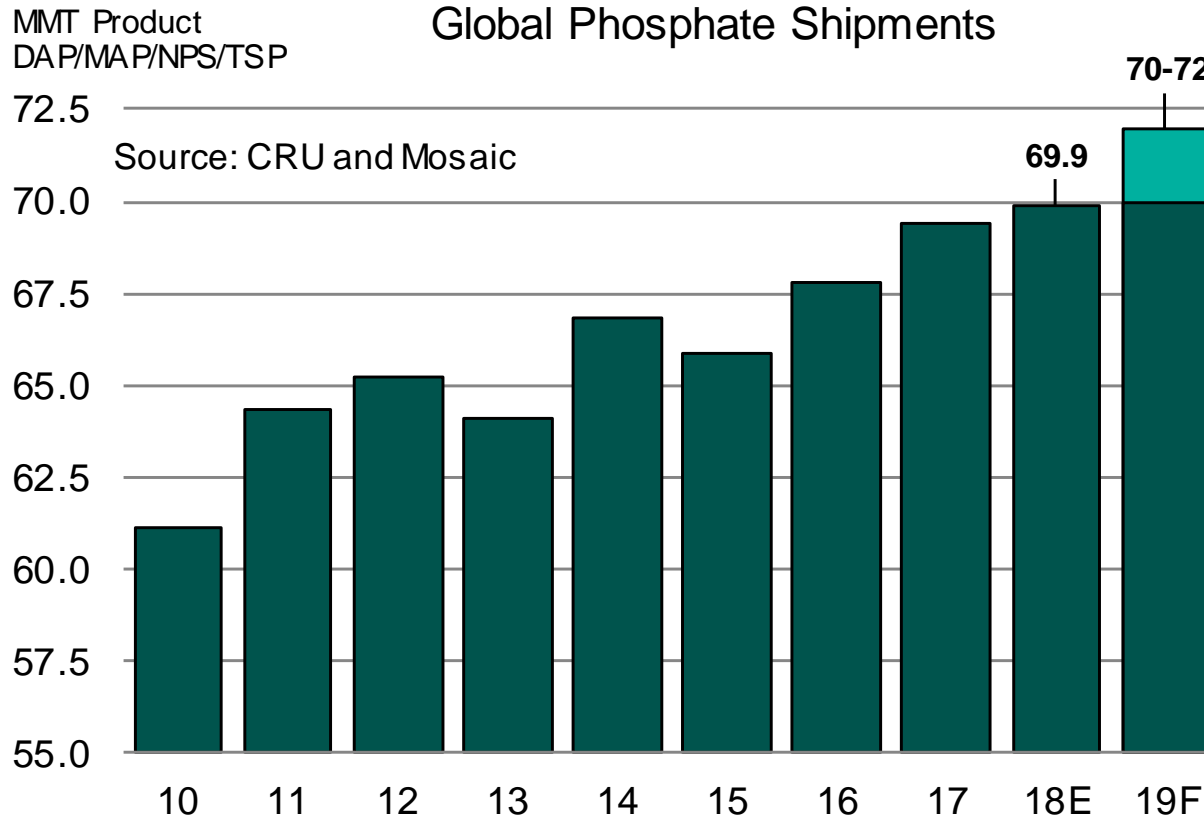


The 11/9/18 soybean/corn new crop price ratio of just 2.33 boosts prospects for more corn acres in 2019

U.S. Big-Three Crop Acreage

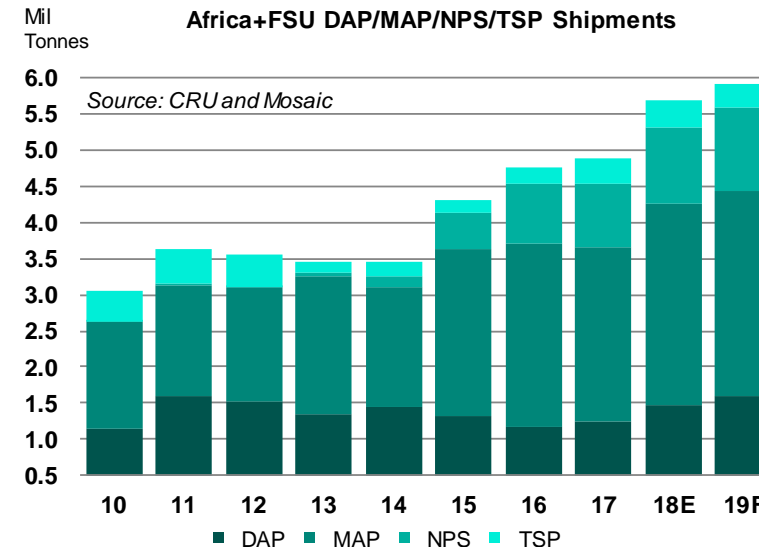
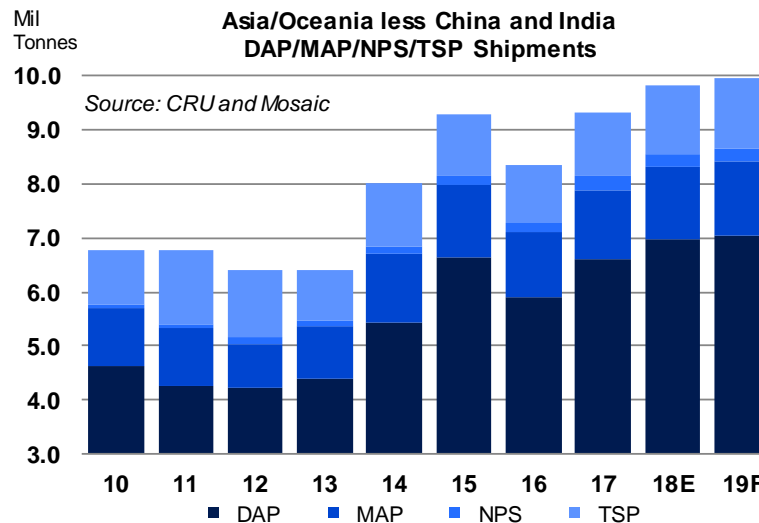
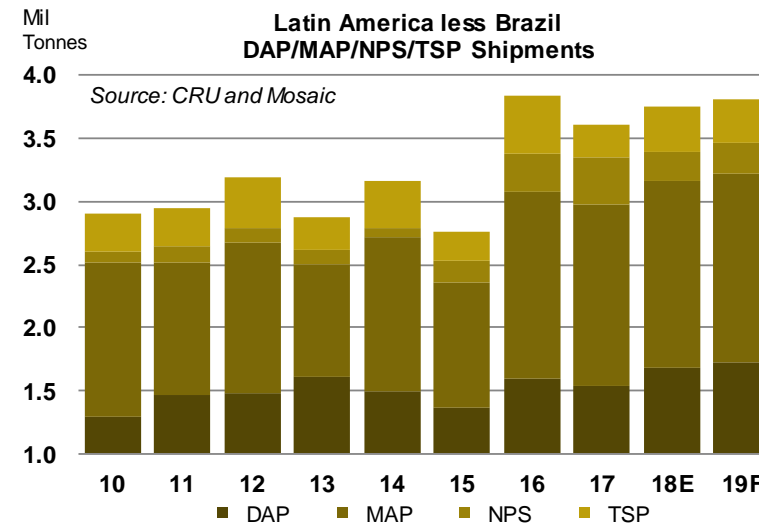
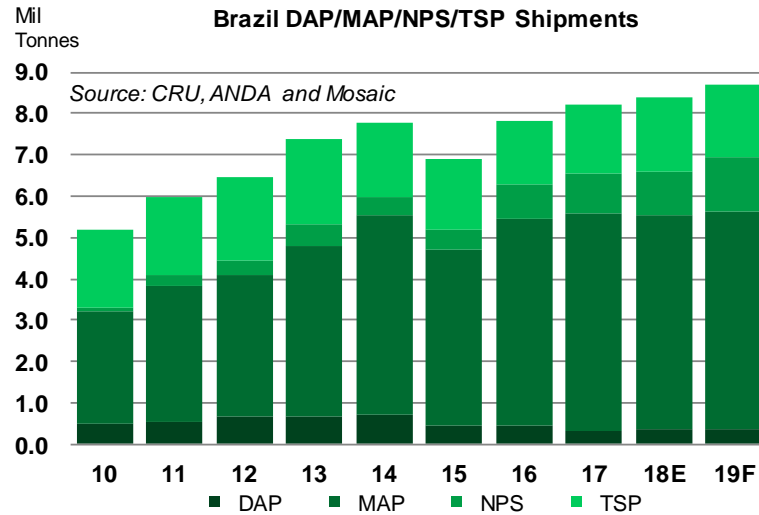
Mil Ac	2012	2013	2014	2015	2016	2017	2018	2019 Guidance		
								Low	Point	High
Corn	97.3	95.4	90.6	88.0	94.0	90.2	89.1	92.0	92.4	93.0
Soybeans	77.2	76.8	83.3	82.7	83.4	90.1	89.1	84.0	84.3	85.0
Wheat	55.3	56.2	56.8	55.0	50.1	46.0	47.8	48.0	48.9	49.0
Total	229.8	228.4	230.7	225.7	227.6	226.3	226.1	224.0	225.6	227.0
Change		-1.3	2.3	-5.0	1.9	-1.2	-0.2	-2.3	-0.5	0.7
Percent Change		-0.6%	1.0%	-2.2%	0.8%	-0.5%	-0.1%	-1.0%	-0.2%	0.3%

Shipments forecast to increase 1.8% in 2019

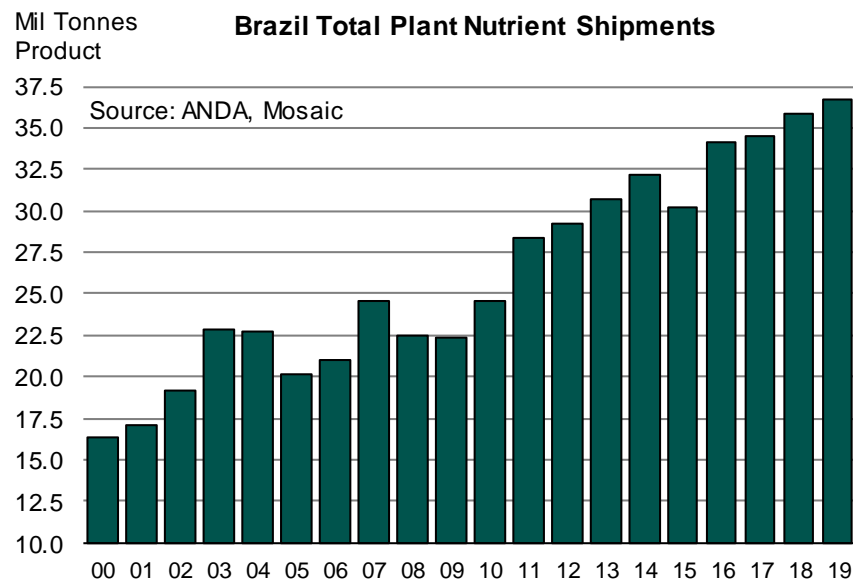


- Shipments of the leading phosphate products are projected to increase 0.6% or 0.5 million to 69.9 million tonnes this year. This adds to the solid 2.4% or 1.7 million tonne increase last year and the 2.9% or 1.9 million tonne gain in 2016.
- Shipments are forecast to increase to 70-72 million tonnes in 2019. Our point estimate of 71.1 million is up 1.8% or 1.2 million tonnes from the 2018 estimate.
- Our current forecast for 2019 is a bit cautious due to: 1) uncertainty about crop prices, 2) higher phosphate prices, 3) drought and lower crop production in some regions, and 4) trade and other policy uncertainties.

Broad-based gains outside China and India



Demand Highlights: Brazil

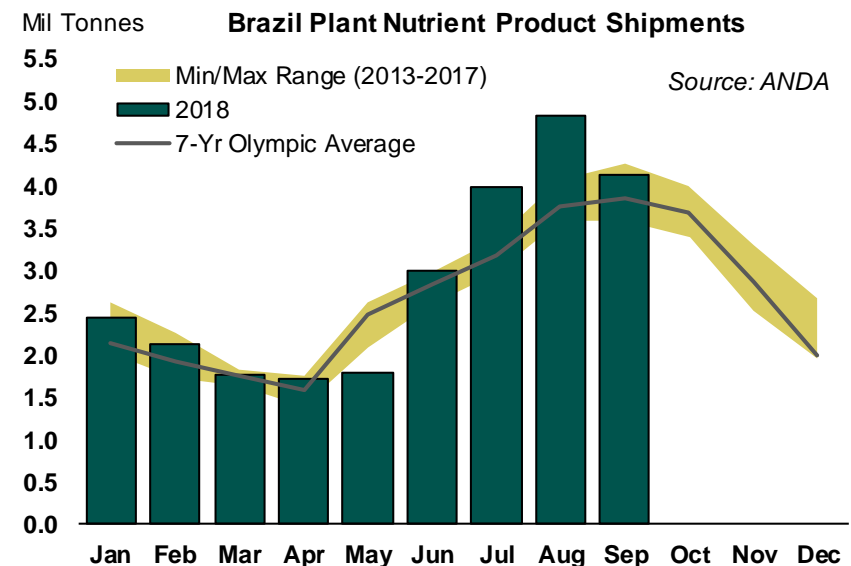


Plant nutrient use has more than doubled since the turn of the century. Shipments of plant nutrient products increased at a compound annual growth rate (CAGR) of 4.4% from 2000 to 2017.

Our Brazilian team now projects that plant nutrient shipments will increase 3.8% or 1.3 million tonnes to 35.8 million tonnes this year. Shipments are projected to increase another 2.7% or 1.0 million tonnes to 36.8 million in 2019.

	<u>Year-To-Date</u>		% Chg Prior Yr
1000 MT	YTD 2018	YTD 2017	
Fert Products	25,774	24,820	4%
N	2,841	2,917	-3%
P₂O₅	3,921	3,821	3%
K₂O	4,346	4,162	4%

Source: ANDA

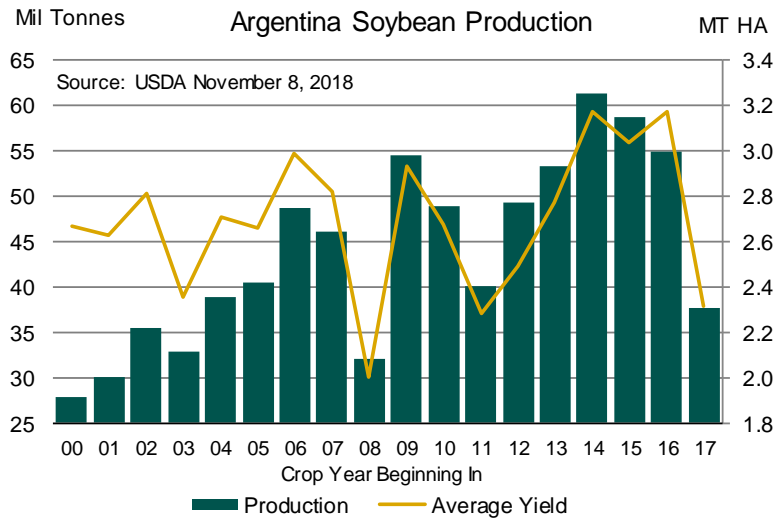


The truckers' strike reduced shipments in May, but shipments during peak months from June through September surged with July and August shipments besting previous high marks for these months by wide margins.

Shipments through September totaled 25.8 million tonnes, up 4% from a year ago. Phosphate shipments were up 3% through September.

Demand Highlights: The Brazil Advantage Today

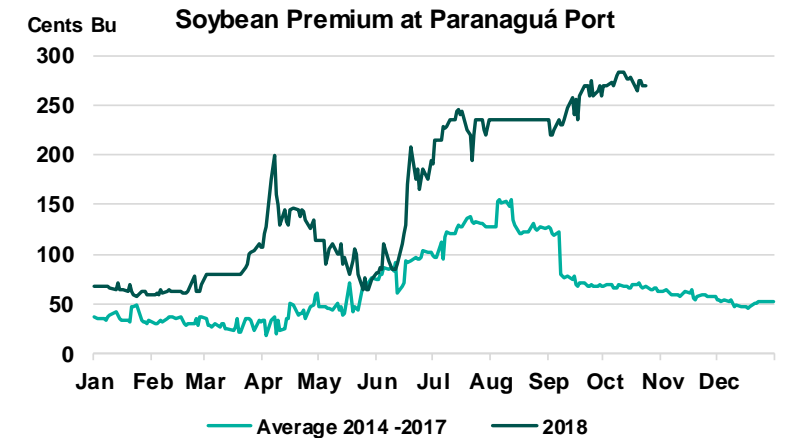
2017/18 Argentine Drought



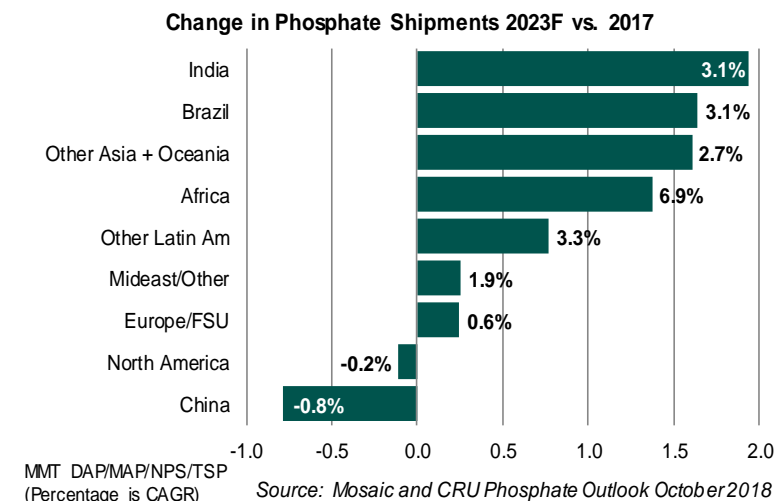
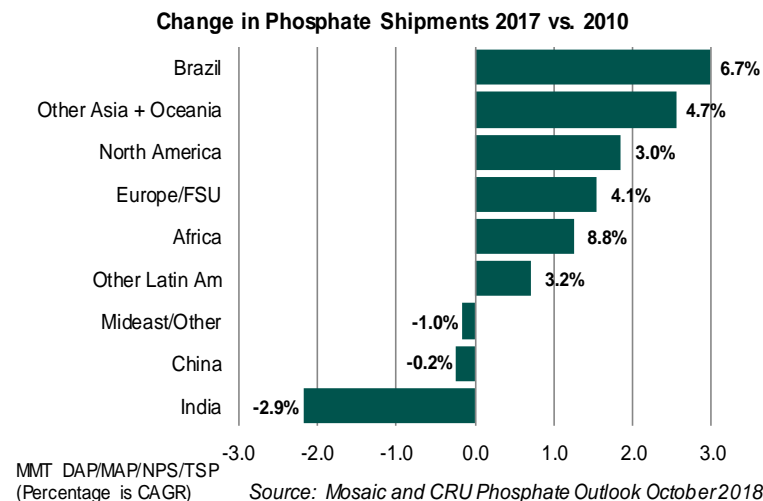
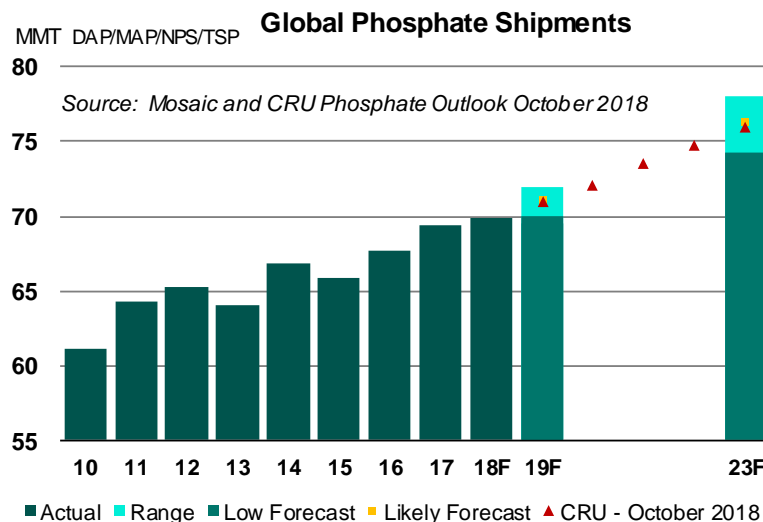
Still Weak Real



U.S.-China Trade War



Positive five-year demand outlook



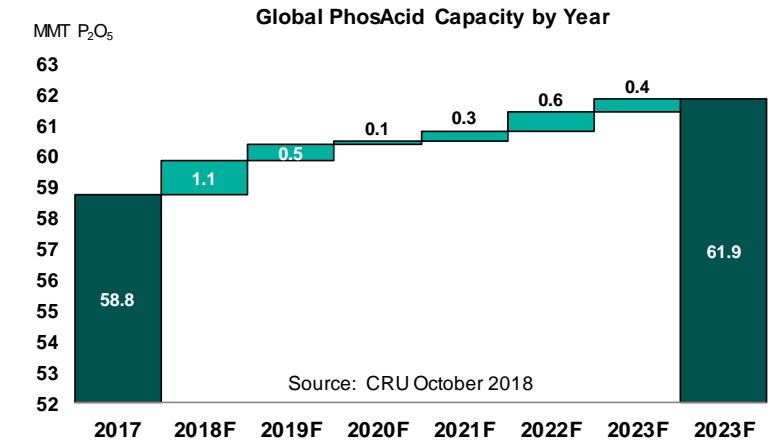
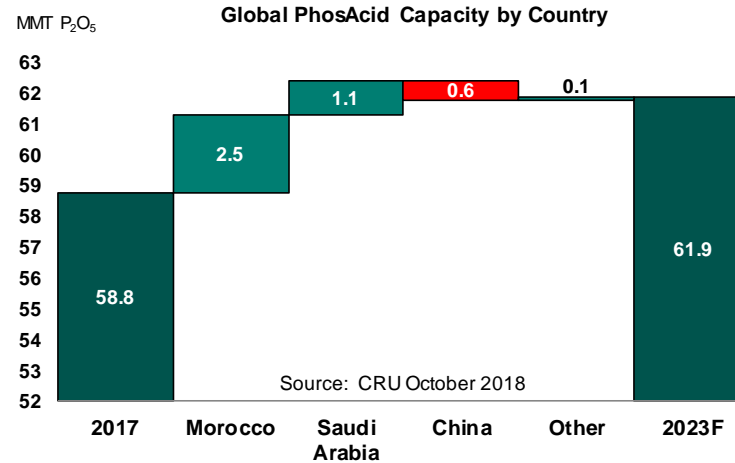
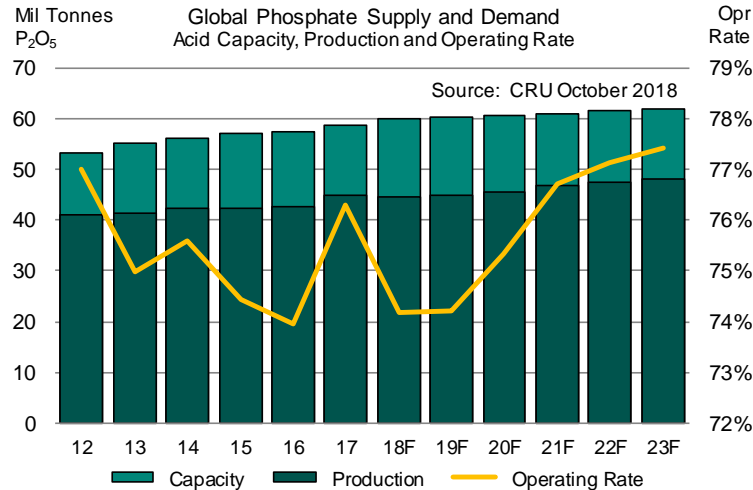
Global Phosphate Shipments

Mil Tonnes DAP/MAP/NPS/TSP	Mosaic Scenario			CRU Oct 2018
	Low	Likely	High	
2010 Shipments		61.1		61.0
2018 Shipments		69.9		70.6
Change 2010-18		8.8		9.6
CAGR 2010-18		1.7%		1.8%
2023 Forecast	74.3	76.3	78.0	76.0
Change 2018-23	4.4	6.5	8.1	5.4
CAGR 2018-23	1.2%	1.8%	2.2%	1.5%

Source: Mosaic and CRU Phosphate Outlook October 2018

- By our most recent count, global shipments of the leading phosphate products increased 1.7% per year or 8.8 million tonnes from 2010 to 2018. India was a drag on demand with shipments dropping 2.2 million tonnes during this period due to subsidy cuts that resulted in a doubling of retail phosphate prices. Demand declined slightly in China with shipments increasing significantly during the first half of this period but then declining during the second half.
- Shipments are forecast to increase 1.8% per year or 6.5 million tonnes from 2018 to 2023. Indian demand is expected to recover due to generally favorable farm economics/demand and expectations of a workable subsidy. Chinese shipments are projected to stabilize following another drop in 2018. Brazil, Other Asia and Africa are projected to post strong gains during this period.

CRU five-year supply/demand forecasts



- CRU projects that global phosphoric acid capacity will increase 3.1 million tonnes P₂O₅ from 58.8 million in 2017 to 61.9 million in 2023. Morocco and Saudi Arabia account for all of the net increase, and the bulk of new capacity is expected online by the end of 2019.
- OCP is expected to add 2.5 million tonnes P₂O₅ from the ramp-up of JPHs 3&4 (0.53 mmt), the addition of Line F (0.45 mmt), the debottlenecking other Jorf lines (0.50 mmt), the start-up of the Laayoune project in Western Sahara in mid-2020 (0.33 mmt) and the start-up of JPH 5&6 (0.675 mmt by 2023). The increase in Saudi Arabia is from the ramp up of the Ma'aden Wa'ad al Shamal Phosphate Company (MWSPC) JV. The next big waves of expansion in Morocco and Saudi Arabia are not expected on line until after the forecast period.
- CRU assumes Chinese phosphoric acid capacity will shrink 600,000 tonnes P₂O₅ as a result of industry restructuring and the enforcement of more stringent environmental taxes and regulations during this period. Several capacity changes are expected in the rest of the world, but the combined 1.6 million tonne projected increase in Russia, Egypt, Turkey, Tunisia, Indonesia and Brazil is offset by the recent idling or announced closures of North American facilities (1.5 million tonnes).
- CRU estimates that the global operating rate dips this year due to a rapid ramp up of new capacity in Morocco and Saudi Arabia this year. The rate then trends upward during the rest of the forecast period.

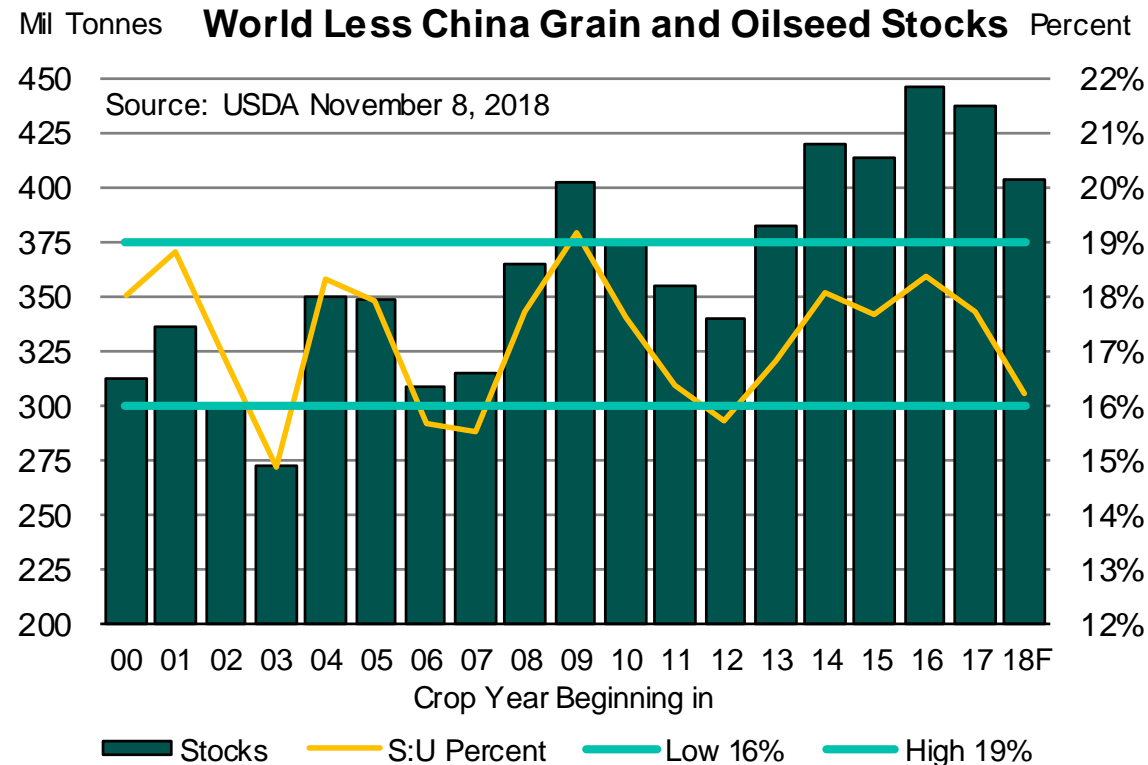
Factors to Watch



Factors to watch

- ★ ■ Agricultural commodity prices
 - Food or farm crisis and impact on phosphate demand?
- Demand developments in key regions
 - Zero growth or more declines in China?
 - Continued recovery in India?
 - An African take-off?
- Ramp-up of new capacity
 - Slower-than-expected or faster-than-expected?
- ★ ■ Chinese phosphate production and exports
 - Significant closures due to environmental regulations or environmental policy backtracking and more government lifelines?
- Competitor strategies and behaviors
 - Price over volume or volume over price?
- Raw materials costs
 - Demand booster or inhibitor and relative advantage or disadvantage?
- Currency risks/opportunities and macroeconomic/political shocks
 - Devaluation or appreciation of key phosphate currencies? (Real, Rupee, RMB, Ruble, Dirham)
 - Trade war or peace?

Crop Prices: 2019 Bullish Bias



- Stocks outside China provide a better and more consistent read of grain and oilseed fundamentals over time in our view (note the recent large revisions).
- The latest USDA estimates indicate that stocks outside China dropped 9 million tonnes in 2017/18 and are projected to drop 33 million in 2018/19.
- The stocks-to-use percentage is projected to decline to just 16.2% by the end of the 2018/19 crop year, a level that correlates with spikes in crop prices that occurred in 2003/04, 2007/08 and 2012/13.

China Phosphate Exports: 2019 Bullish Bias

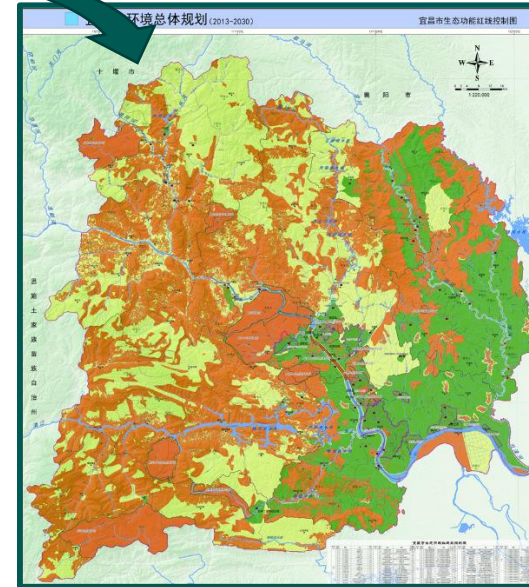
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Yichang City Case Study



- The Yangtze River basin accounts for nearly all of China's phosphate rock and about 90% of its finished phosphate production.
- Hubei is the largest phosphate rock producing province, accounting for about one-third of China's total production.
- Yichang City – home of the Three Gorges Dam – has 20 million tonnes of rock mining capacity and 6.0 million tonnes of DAP/MAP capacity (note that a “city” is comparable to a U.S. county).

China Phosphate Exports: 2019 Bullish Bias



- The State Council has developed standards and guidelines for provincial and city governments to use in implementing new environmental regulations.
- Based on ecological factors, the Yichang City government in 2015 classified area within the river basin as Prohibited (orange), Controlled (yellow) or Optimizing (green).
- In October 2017, the Yichang City government decreed that all industrial activities in Prohibited areas must stop by the end of 2019. The government expected that phosphate rock output would decline 30% already in 2018, forcing some producers to purchase more expensive rock from far-away producers in the southwest or shut down.
- Our team in Beijing visited Yichang City earlier this year. Our team's assessment is that about two-thirds of the 6.0 million tonnes of DAP/MAP capacity in Yichang City is at risk of closure by the end of 2019. Stay tuned – 2019 could be a watershed for the Chinese industry.
- We expect that environmental regulations will reduce Chinese exports next year as firms throughout the Yangtze River basin begin to comply with new provincial and city regulations, but other factors such as import demand in the region, relative raw materials costs, domestic demand, and exchange rates also could impact prices and exports.

Thank You!

Phosphate Supply/Demand Outlook

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Fertilizer Outlook and Technology Conference
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