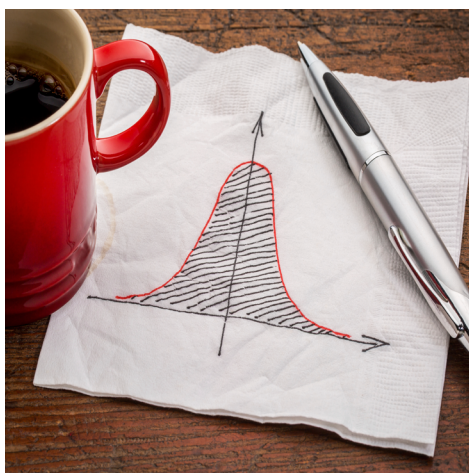


Market Mosaic

May 2016

Updating Handicaps



Market Mosaic is a newsletter published for our customers, suppliers and stakeholders by the Market and Strategic Analysis group of The Mosaic Company. Some issues assess the near term outlook for agricultural and plant nutrient markets while others take an in-depth look at a topic of interest to our readers.

The February issue of Market Mosaic explored the phosphate (P) and potash (K) outlook by describing and handicapping three price scenarios. We labeled these scenarios **An Uptick**, **Another Step Down**, and **A Rebound** and assigned handicaps of .60, .20, and .20, respectively.

The beginning of May is a good time to look back at developments so far this year and assess their potential impacts on P&K markets. Recent events such as the rally in agricultural commodity prices, the strengthening of key currencies, workable Indian subsidies, and political twists and turns in Brazil merit a close look. This issue of Market Mosaic examines several of these developments in detail and updates our handicaps of these three scenarios.

The bottom line is that a moderate uptick in prices later this year still is the most likely scenario, but we have lowered its handicap from .60 to .50. The prospect of a stronger rebound in prices still looks less likely, but we have increased its handicap from .20 to .30 due to the potential impact of recent developments. The odds of another step down in prices also looks less likely, and we have maintained our handicap of .20 based on the large drop in prices that already has occurred and our assessment of a balanced supply and demand situation this year.

Our minor re-handicapping of scenarios is driven by a few important supply and demand changes. On the demand side of the ledger, recent gains in crop prices, increasingly strong demand drivers in India, favorable currency moves, and lower channel inventories underpin solid P&K shipment prospects during the remainder of this year. The update of our global shipment forecasts netted only minor changes to our point estimates and re-affirmed our previous assessments. However, we narrowed forecast ranges based on first quarter statistics and other information from key geographies. More importantly, it looks like seasonal pressure will build from a bunching of shipments from June to October.

On the supply side of the ledger, raw materials prices have dropped sharply during the last year and now appear to be stabilizing at current values. So, additional cost savings from further declines likely are limited. A few key P&K currencies are beginning to strengthen along with the rebound in oil prices. As a result, the large cost benefits from currency depreciations are beginning to abate. We expect that this change, combined with lower P&K prices and a flare-up of inflation, eventually will pinch margins and impact marketing strategies of several large exporters. Finally, we do not expect new P&K capacity to deliver material tonnage in 2016.

Agricultural Commodity Prices: The Funds See Something

One of the most significant developments so far this year is the recent rally in agricultural commodity prices. Oilseeds are leading the charge. The new crop price of soybeans increased 16% or \$1.38 per bushel between March 1 and April 29, and palm oil prices have climbed more than 40% since bottoming last summer. Even new crop corn prices have recovered from the large drop that occurred after the release of a bearish U.S. Prospective Plantings report on March 31.

– continued inside

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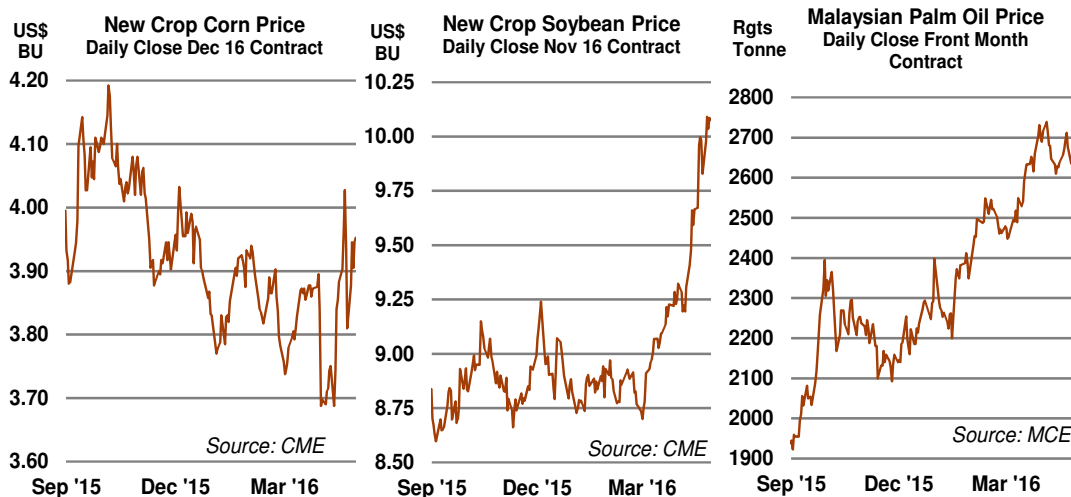
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Analysts have pointed to the large inflow of money into commodity funds as the main driver of the rally, but fund managers move money based on convictions about fundamentals - and there are several positive developments in agricultural commodity markets.

The first comes courtesy of Mother Nature. Although the 2015/16 El Niño had a less-than-expected impact on the closely watched South American harvest, it still left its mark. Drought typically associated with an El Niño event shriveled crops in several regions. For example, the latest statistics from the Malaysian Palm Oil Board show that production in the first quarter was off 10% from a year ago. Indonesian Palm Oil Association (GAPKI) statistics show that output has declined each month since last September with March output dropping to a 13-month low. Rice, sugar and coffee crops across south Asia also were impacted with the global rice harvest now projected to decline for the first time since 2010. This year's South African corn crop, the smallest since 1994/95, was down 39% from last year and 56% from two years ago, according to latest USDA estimates.

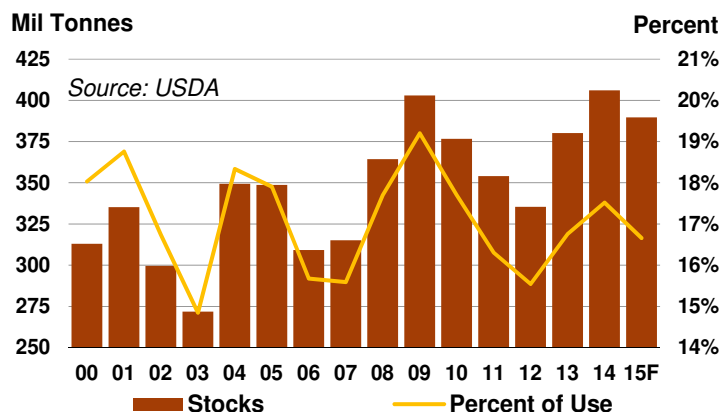
The mark of El Niño is even showing up as combines roll in Brazil and Argentina. Many Brazilian soybean crop estimates have been revised down to 98-99 million tonnes, still a record but off from earlier estimates of 102-103 million. Hot and dry weather also is shrinking the Safrinha corn crop. Consultant ARG recently lowered its estimate from 85.1 million tonnes to 79.6 million. The smaller-than-expected crop coupled with larger-than-expected exports earlier this year (fueled by a real north of R\$4.00) has caused Brazil to suspend its import duty on corn in order to facilitate needed imports. In Argentina, excessive rainfall in key growing states has caused horrific flooding and significant damage to the soybean crop. The Argentine agricultural ministry lowered its

estimate of this year's soybean crop from 60.9 million tonnes to 57.6 million, and the Buenos Aires Grains Exchange reduced its estimate from 60 million to 56 million tonnes.

The cumulative impacts of this year's El Niño are showing up in USDA statistics, and we anticipate that more adjustments are likely in future reports. For example, global grain and oilseed production now is projected to total 2.99 billion tonnes in 2015/16, down almost 2% or 44 million from the record last year and off 17 million from USDA's estimate last September. The split between China and the rest of the world

is even more telling. Grain and oilseed production in China is projected to increase 11 million tonnes while output in the rest of the world is forecast to drop 55 million tonnes this year. As a result, grain and oilseed inventories outside of China are forecast to decline 16 million tonnes to 390 million or 16.7% of use, 40 basis points less than the average since 2000/01.

World Less China Grain and Oilseed Stocks



Fund managers no doubt are also peeking ahead to the 2016/17 crop year. Some concern is beginning to brew about the upcoming North American growing season due to the likelihood of a faster-than-expected transition from El Niño to La Niña. La Niña typically is associated with a hot and dry summer in U.S. Corn Belt, and a few managers likely are placing risk-on bets.

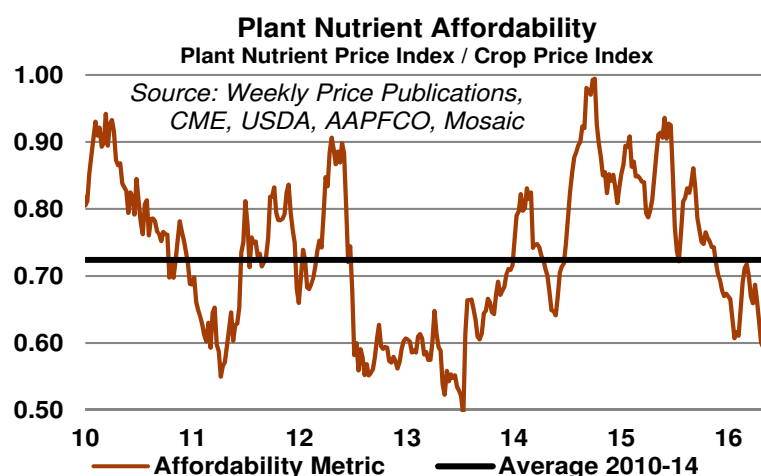
In addition to the long list of weather concerns, several other developments also are helping to fuel the rally in agricultural commodity prices. First, the trade-weighted dollar index has declined more than 6% since peaking in mid-January, and a weaker dollar bolsters prices for highly-traded commodities. The appreciation of the Brazilian real, in particular, is one of the key drivers of the rally in oilseed and oilseed product prices. Second, it looks like concerns about China's appetite for commodities is beginning to wane. Soybeans are a prime example. The market

"The recent rally in agricultural prices coupled with continued moderate plant nutrient prices has improved plant nutrient affordability and underpins a solid demand outlook."
- Dr. Michael R. Rahm

fretted over the 18% drop in Chinese imports in January, but normal arrivals in February and record imports of 6.1 million tonnes in March brought the first-quarter total to 16.3 million tonnes, up 4% from a year ago and on track for another record in 2016.

Global P&K Shipments: A Spring Cleaning of the Distribution Channel

The recent rally in agricultural prices coupled with continued moderate plant nutrient prices has improved plant nutrient affordability and underpins a solid demand outlook. Our affordability metric, the ratio of a plant nutrient price index and a crop price index, registered .59 at the end of April, down 33% from a year earlier and off 18% from the five-year average. This was the lowest reading in almost three years. The drop resulted from the combination of a decline in the plant nutrient price index and an increase in the crop price index. The plant nutrient index was down 29% while the crop price index was up 5% from readouts a year ago.



We have updated our global P&K shipment forecasts based on recent developments. In the case of phosphate, we now project that global shipments of the leading high-analysis products will total 65-66 million tonnes this year. Our point estimate is a record 65.6 million tonnes, up from 64.4 million in 2015 and just a whisker greater than our previous estimate of 65.5 million. In North America, we project that phosphate shipments will reach 8.9-9.0 million tonnes in 2016, in line with 9.0 million in 2015. Our demand forecast assumes that grain markets ultimately will bid for, and U.S. farmers will plant, about 92 million acres of corn, 84 million acres of soybeans, and 50 million acres of wheat in 2016/17. No change in P&K application rates are expected.

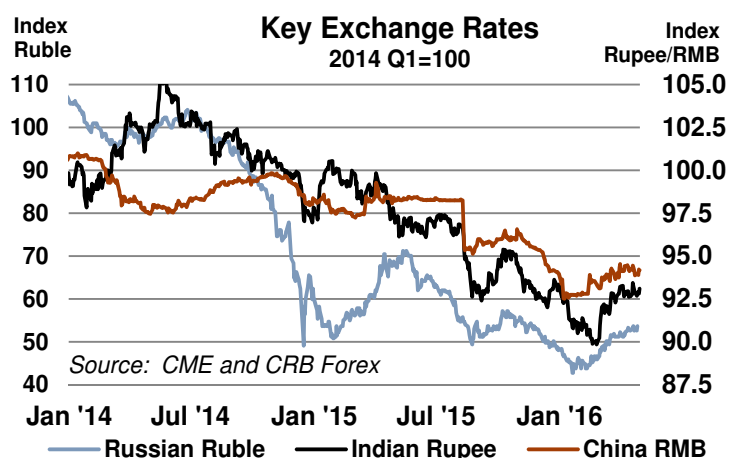
In the case of potash, we now project that global MOP shipments will total 59-60 million tonnes this year. Our point estimate is 59.7 million tonnes, down from 61.1 million in 2015 but the third highest on record. The point estimate is unchanged from our prior forecast and keeps potash shipments in the higher range established during the last two years. In North America, shipments are projected to total 9.1 to 9.2 million tonnes in 2015/16, up from 8.9 million in 2014/15.

Key Currencies: Tail Winds Abate

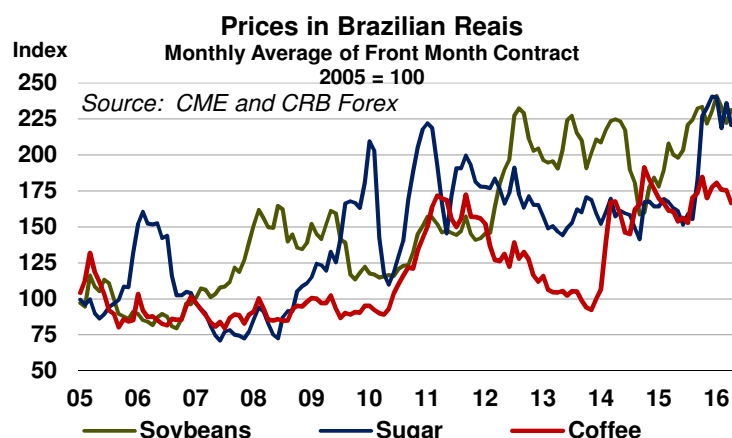
Another constructive development is the strengthening of key P&K currencies. Some currencies such as the Russian ruble and Canadian dollar had followed oil prices down. Now they are tracking prices back up. Other currencies such as the Indian rupee, Chinese RMB,

and Brazilian real are moving up in response to improved economic prospects or the expectation of positive political changes.

A couple of first-quarter changes are noteworthy. The first is the significant strengthening of the Russian ruble. The ruble traded at just less than 65 per dollar at the end of April, up 26% from a low of 82 in January. The concern at that time was that the ruble was headed to triple digits if oil prices continued to slide. Now, strong tail winds from the collapse of the ruble are beginning to abate for Russian P&K exporters. In addition, inflation rates have soared during the last couple of years. The December-to-December increase in consumer prices jumped from 6.4% in 2013 to 11.4% in 2014 and to 12.9% in 2015. The most recent reading for March still showed a 7.3% increase from these elevated levels during the last 12 months. We expect that the combination of large declines in P&K prices, a stronger ruble, and increasing cost pressures will begin to pinch margins for Russian exporters this year.



The second noteworthy development is the stabilization and even slight strengthening of the Chinese RMB this year. The RMB traded at 6.48 per dollar at the end of April, up slightly from a low of 6.59 in mid-January. The great fear then was that the RMB was on its way to an 8-handle if economic conditions continued to erode, and that a collapse of the RMB would crater costs for Chinese phosphate producers much like the collapse of currencies sharply lowered costs for Belarussian and Russian potash producers. However, the large drop in phosphate prices late last year, the stable to slightly stronger RMB this year, and a fully-implemented 13% VAT tax also is expected to begin to squeeze margins for Chinese exporters.

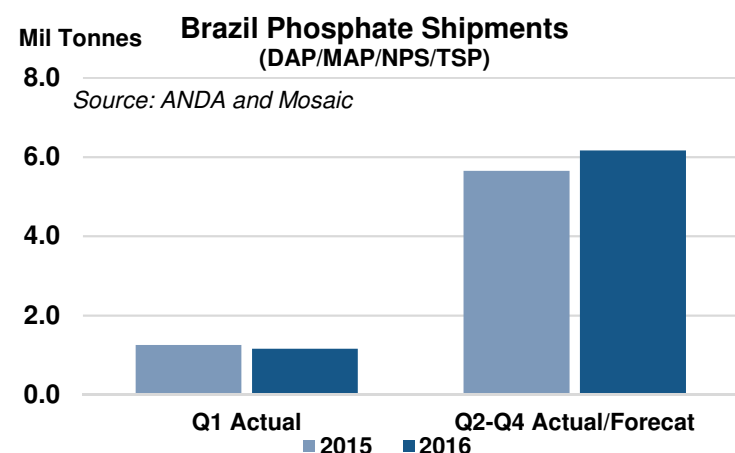
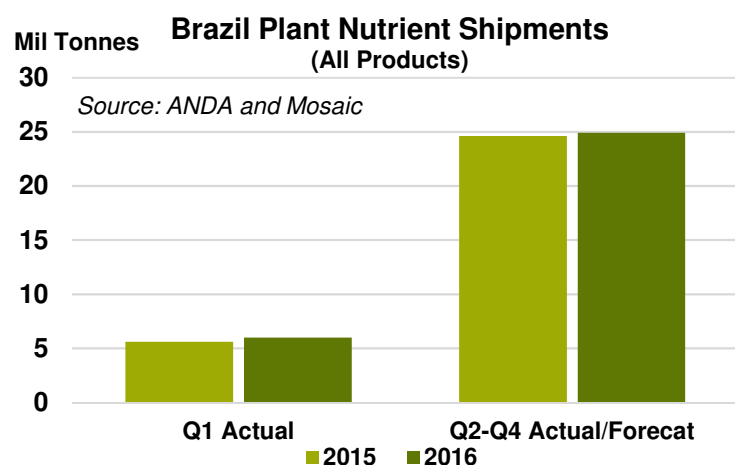


In the case of potash, we have long maintained that the collapse of currencies for the major exporters and the corresponding large drop in costs was the main driver of the decline in prices last year. If currencies continue to appreciate this year, we will see if the corollary holds true.

Brazil: Positive Agricultural Outlook

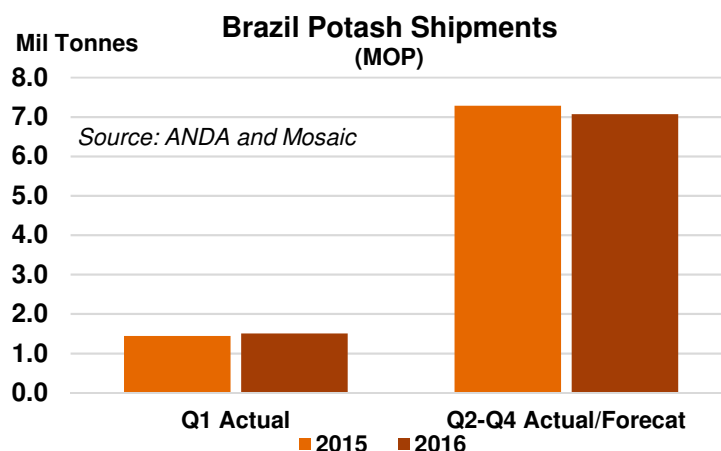
Despite the political and economic turmoil in Brazil, the outlook for the agricultural sector continues to look positive. Farm economics remain solidly profitable due to the recent rally in key crop prices and a still-weak real. Local currency prices of soybeans, sugar and coffee are trading at near-record values today, and the more extensive use of barter as well as an earlier release of subsidized credit is helping to keep crop inputs moving to the farm.

First quarter statistics show that plant nutrients indeed are moving to the farm. Shipments of all products totaled just less than 6.0 million tonnes in Q1, up 7% or nearly 400,000 tonnes from last year. Shipment forecasts for the entire year also are moving up with most projections now ranging from 30.7 to more than 31.0 million tonnes. Shipments last year totaled 30.2 million tonnes. Assuming the mid-point of the range, shipments during the last three quarters of the year would need to total about 24.9 million tonnes, up 300,000 tonnes from the same period last year.



In the case of phosphate, shipments of the leading high-analysis products from production and import points into the distribution channel are projected to total about 7.3 million tonnes this year, up 6% from 6.9 million last year but less than the peak of 7.5 million in 2014. Shipments totaled 1.15 million tonnes during the first quarter, off 8% or 100,000 tonnes from a year ago. If our forecast for the year is on target, shipments during the last three quarters of the year will need to total 6.2 million tonnes, up 9% or 500,000 tonnes from the same period last year.

In the case of potash, shipments of MOP from production and import points are projected to total 8.6 million tonnes this year, down about two panamax vessels from last year. Shipments totaled 1.50 million tonnes during the first quarter, up 4% or 60,000 tonnes from 1.44 million a year ago. If our forecast for the year is on target, shipments during the last three quarters of the year will need to total 7.1 million tonnes or about 200,000 tonnes less than the 7.3 million that shipped during the same time last year.



India: Demand Expectations Build

Indian P&K demand prospects continue to improve due to several developments. First and most importantly, after two years of below-average monsoons, the initial forecast for an above-average monsoon is boosting P&K demand projections as well as sentiment throughout the distribution channel. The Indian Meteorological Department (IMD) released its initial rainfall forecasts on April 12. Forecasts indicated that expected rainfall likely would total 106% of the long period average (LPA). The forecast showed that there is a 94% likelihood that rainfall would be normal or better with the odds of normal precipitation (96%-104% of LPA) estimated at 30%, above normal (104%-110% of LPA) at 34%, and excess (more than 110% of LPA) at 30%.

Second, the Indian rupee has strengthened about 4% from a low of 68.7 rupees per dollar as late as February 25 to 66.3 at the end of April. India's economy has performed well relative to many other countries, and the prospect of an above-normal monsoon has spurred expectations for even stronger growth given the large contribution of agriculture to Indian GDP.

Finally, import economics work due to the decline in P&K prices, lower but workable 2016/17 subsidies, and a stronger-than-expected rupee. The government reduced the DAP subsidy 28% but barely changed the MOP subsidy for 2016/17. A new twist is that the government will review and potentially adjust the subsidy every six months rather than annually.

2016/17 Indian Subsidy Summary

Rupees	2015/16		2016/17 (Kharif)		
	R/kg Nutrient	R/Tonne	R/kg Nutrient	R/Tonne	R/MT Chg
DAP (N)	20.875	3,758	15.854	2,854	-24.1%
DAP (P ₂ O ₅)	18.679	8,592	13.241	6,091	-29.1%
DAP	19.297	12,350	13.976	8,945	-27.6%
MOP	15.500	9,300	15.470	9,282	-0.2%

The main issue now is how the market will split the spoils between exporters, importers and farmers. The tables show our estimates of the maximum price importers could pay for DAP and MOP at different combinations of exchange rates and retail prices. These calculations assume a healthy importer margin of 1,500 rupees per tonne, fees based on current duty, tax and insurance rates, and a 2,800 rupees per tonne bagging, handling and transportation cost to move product from vessel to a retail store shed.

In the case of DAP, if the rupee continues to trade between 66 and 67 per dollar, and the retail price stabilizes in the 21,500 to 22,500 rupees per tonne range, then the maximum price importers could pay for DAP ranges from about \$365 to \$385 per tonne c&f Indian port. In the case of potash, if the retail price is 13,000 to 14,000 rupees per tonne and the rupee trades between 66 and 67 per dollar, then the maximum import price ranges from roughly \$255 to \$270 per tonne. The maximum retail prices (MRP) for DAP and MOP were 23,700 and 16,000 rupees per tonne in 2015/16.

Estimated DAP Maximum Import Price (\$ Tonne)

		Retail Price (Rupees/Tonne)					
		21,000	21,500	22,000	22,500	23,000	23,500
Rupees/\$	65	\$369	\$377	\$385	\$392	\$400	\$408
	66	\$364	\$371	\$379	\$386	\$394	\$401
	67	\$358	\$366	\$373	\$381	\$388	\$395
	68	\$353	\$360	\$368	\$375	\$382	\$390
	69	\$348	\$355	\$362	\$369	\$377	\$384
	70	\$343	\$350	\$357	\$364	\$371	\$379

Estimated MOP Maximum Import Price (\$ Tonne)

		Retail Price (Rupees/Tonne)					
		12,000	12,500	13,000	13,500	14,000	14,500
Rupees/\$	65	\$245	\$253	\$261	\$269	\$276	\$284
	66	\$242	\$249	\$257	\$265	\$272	\$280
	67	\$238	\$246	\$253	\$261	\$268	\$275
	68	\$235	\$242	\$249	\$257	\$264	\$271
	69	\$231	\$239	\$246	\$253	\$260	\$267
	70	\$228	\$235	\$242	\$249	\$257	\$264

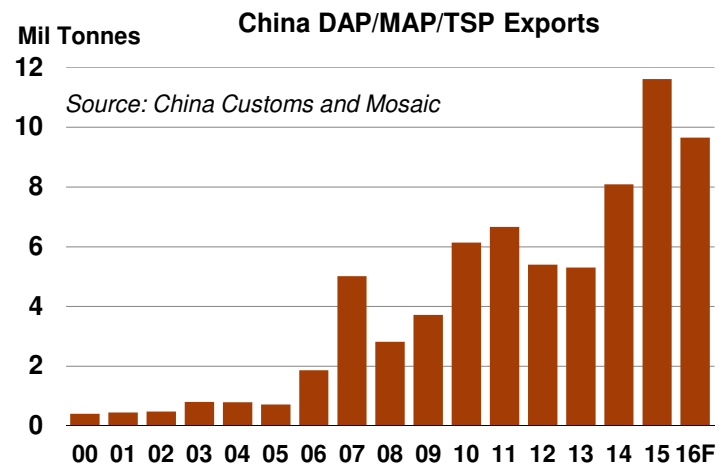
We have boosted our phosphate shipment forecasts in response to these developments. DAP/MAP/TSP shipments now are projected to total just less than 9.2 million tonnes in calendar 2016, up from our previous estimate of 8.7 million and just a couple of vessels short of more than 9.2 million in 2015.

In the case of closely-watched DAP imports, we project that imports will total more than 5.5 million tonnes this calendar year, off from 6.2 million in 2015 due to a large drawdown of channel inventories this year. Imports got off to a slow start this year with DAP imports tallying less than 185,000 tonnes in Q1, down from 356,000 tonnes during the same period last year. If our forecast for the year is on target, imports during the last three quarters of this year will total just less than 5.4 million tonnes, off 9% from 5.9 million a year ago. However, our current forecast assumes that imports will total only 1.6 million tonnes in Q2 and then jump to 2.6 million tonnes in Q3. DAP imports registered 2.6 million and 2.5 million tonnes in Q2 and Q3 last year. So, the bulk of imports are expected to ship at about the same time that Brazil and North America also are in full swing.

In the case of potash, MOP imports are projected to total 4.0 to 4.2 million tonnes in calendar 2016, up from 4.0 million tonnes last year. Imports during the first quarter totaled 640,000 tonnes, down from 979,000 tonnes last year. This implies that MOP imports during the last three quarters of the year will total about 3.4 million tonnes, up from 3.0 million during the same period last year.

China: Exports Off to a Slow Start

The latest Customs statistics show that nitrogen and phosphate exports are off to a slow start compared to the record pace of last year. In the case of phosphate, exports of high-analysis products (DAP/MAP/TSP) dropped 35% or 560,000 tonnes in the first quarter. Offshore shipments in April likely were also lower than a year ago. A correspondingly slow start to Indian buying is one reason for the decline, but unprofitable export economics have caused some producers to curtail production. The Chinese Phosphate and Compound Fertilizer Industry Association reported that total phosphate production was down 5% during the first two months of the year. China exported a record 11.6 million tonnes of high-analysis phosphate products last year. We now project that shipments will drop about two million tonnes to 9.6 million in 2016.





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