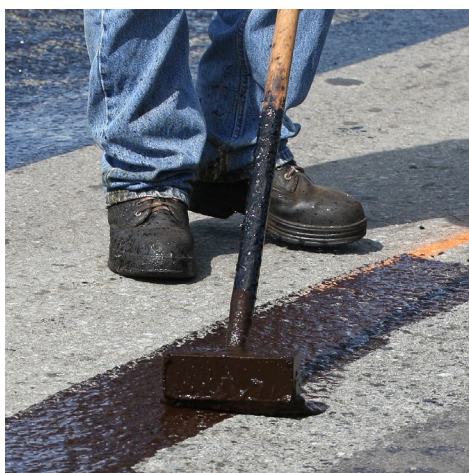


Market Mosaic

November 2015

Tarred With the Same Brush



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.

It looks to us like equity markets are trading P&K prices that are a big step down from current spot prices. Markets are fretting over a long litany of potential negative developments such as further declines in agricultural commodity prices, a persistently strong dollar, fallout from a slowdown of the Chinese economy, and the start-up of large greenfield capacity by a few new entrants. Those are legitimate concerns, but it also looks like equity markets are discounting potential positive developments and unfairly tarring plant nutrients with the same brush used on many energy and hard commodities. This issue of Market Mosaic lays out reasons why P&K fundamentals look stronger to us than what equity markets are trading today.

We draw three main conclusions from our read of markets. First, unlike some of the energy and metals markets, we see recent declines in crop prices as the result of normal weather-driven volatility rather than a structural change in agricultural commodity markets. Crop prices are expected to continue to vary within an elevated range in response to the whims of Mother Nature. We see no chronic imbalance in global grain and oilseed markets. Most importantly, the long term food story, while not in vogue today, still looks solidly intact and underpins a positive outlook for plant nutrient demand.

Second, we see the drop in potash prices this year mainly as the result of the combination of large channel inventory builds last year and the collapse of several key potash currencies. This differs from conventional explanations that point to massive excess capacity as well as anemic demand. We expect that potash prices will stabilize at levels greater than what equity markets are trading today when channel inventories get worked down (most likely by the end of this year), when macroeconomic conditions calm down, and when the market figures out that current operational capacity is much less than nameplate capacity and that material supplies from large greenfield projects are at least two to four years out.

Finally, we think equity markets continue to discount the positive phosphate outlook. Unlike most other commodities, phosphate stripping margins today are greater than a year ago as a result of steady product prices and significant declines in raw materials costs. Stable margins this year are undergirded by steady demand and several changes on the supply side of the ledger. We expect that equity markets will take note at some point.

Weather-Driven Volatility -- Not a Structural Imbalance

Agricultural commodity prices are trading well below the extraordinary peaks of the past several years, but recent declines have resulted largely from normal weather-driven volatility rather than a structural imbalance in agricultural commodity markets. This is not the 1980s farm crisis.

The charts below show that global grain and oilseed inventories rise and fall largely as a result of variations in yield. Global stocks dropped for three straight years from

– continued inside

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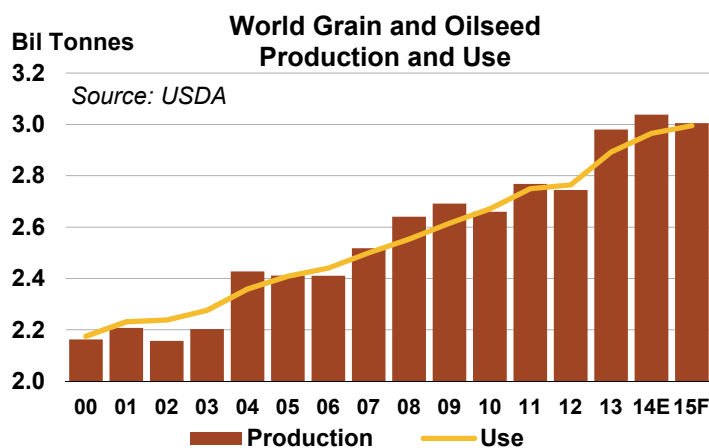
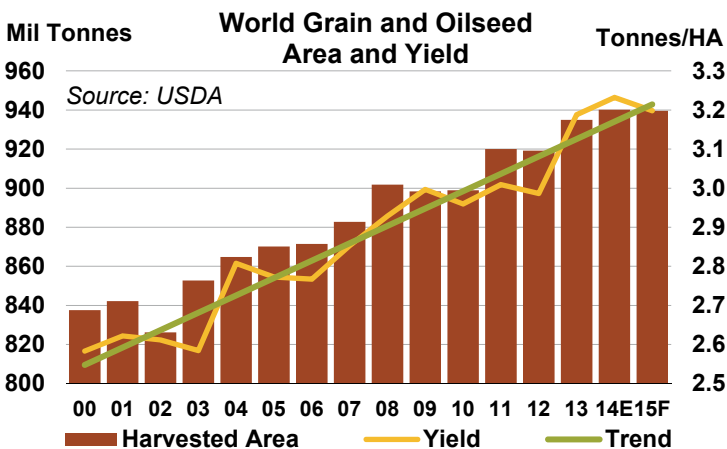
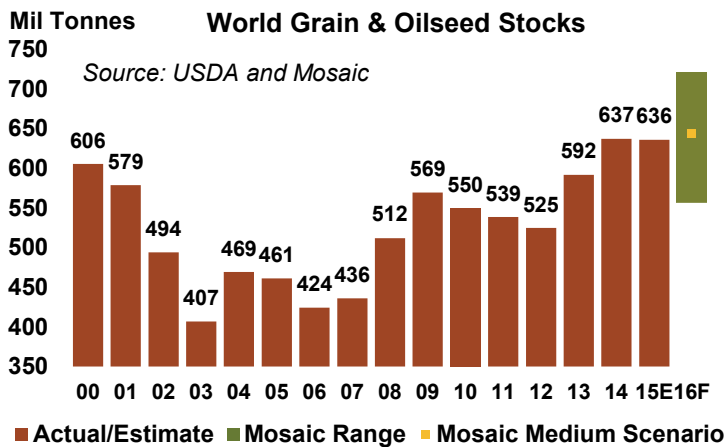
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2009/10 to 2012/13 due to a string of below-trend yields. As a result, prices for many grain and oilseed crops climbed to record highs during the 2012/13 crop year.

Farmers responded by planting more area and applying more technology to crops. That coupled with a more cooperative Mother Nature resulted in yields well above trend in both 2013/14 and 2014/15. Global grain and oilseed production took a giant step up. For example, the global harvest had never exceeded 2.8 billion tonnes prior to 2013/14, but production has averaged 3.0 billion tonnes during the last three years. As a result, crop prices have declined in response to the rapid rebuilding of inventories during the last two years. Crisis averted for now.

The latest USDA estimates put the 2015/16 average yield just a whisker below trend. Not surprisingly, global inventories are projected to shrink a little bit this crop year. Put another way, demand is projected to gobble up the second largest crop the world has ever produced. The giant step up in grain and oilseed production that resulted in significant stock builds just two years ago now is required to meet demand.

A farming-with-spreadsheets exercise demonstrates the wide range of potential outcomes for the 2016/17 crop year. The chart shows projected grain and oilseed stocks at the end of 2016/17 for extreme yield assumptions. The low end of the range assumes an average yield equal to trend less the largest negative deviation from trend since 2000/01. The high end of the range assumes a yield equal to trend plus the largest positive deviation since 2000/01. In short, we are one blockbuster harvest away from a farm crisis (the market bias today) and one disaster away from a food crisis (not a concern today despite the Godzilla El Niño).

New crop prices for 2016/17 continue to trade at moderate levels with corn, soybean and wheat prices in \$4, \$9 and \$5 per bushel range, respectively. Markets are expected to bid for enough acres to prevent a large de-stocking. Indeed, very early estimates of 2016 U.S. acreage indicate that farmers likely will plant as many or even more acres to the major crops next spring.

Crop	2015 USDA (Oct Est)	2016 Farm Futures (Sep Est)	2016 Informa (Oct Est)
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Corn	88.4	89.6	90.8
Soybeans	83.2	86.3	83.9
Wheat	54.6	55.9	54.0
Cotton	8.6	9.8	9.6

Finally, the long term food story is not in vogue today, but it still is intact. This analysis and our long term models indicate that farmers will need to harvest more area and increase yields at trend rates or more year after year in order to meet projected grain and oilseed demand. There is no long term structural imbalance in global agricultural commodity markets.

Not Oil or Iron Ore

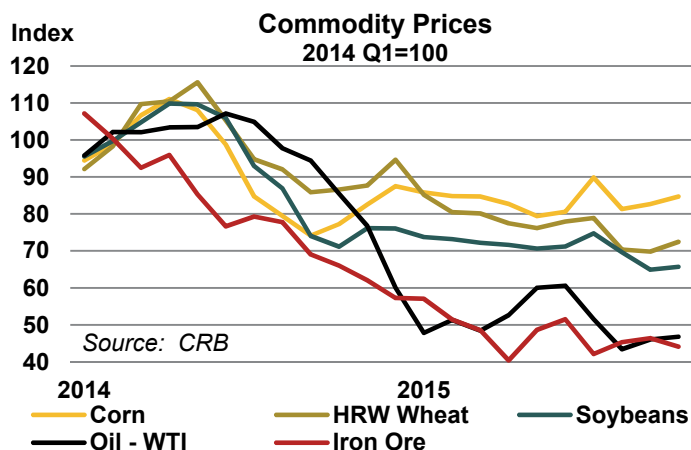
Agricultural commodity fundamentals differ from key energy and metals fundamentals. Recent developments such as advances in hydraulic fracturing technologies, a shift in OPEC strategies, over-investment in new capacity, and a slowdown in the Chinese

"... recent [agricultural commodity price] declines have resulted largely from normal weather-driven volatility rather than a structural imbalance in agricultural commodity markets."

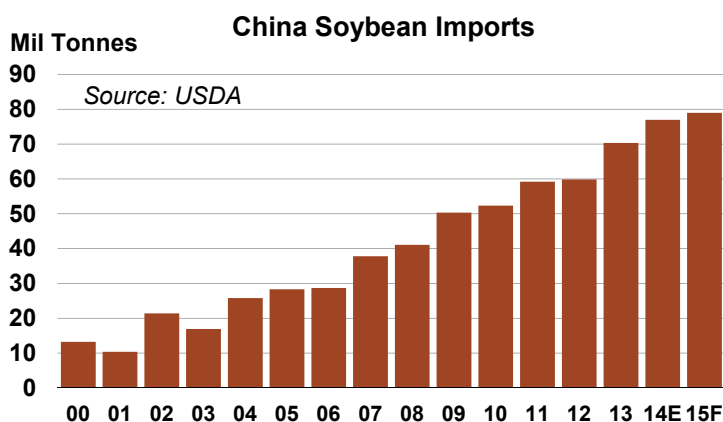
- Dr. Michael R. Rahm

economy have caused structural changes in some energy and metals markets.

For example, the chart below shows that oil and iron ore prices have dropped more than corn, wheat and soybean prices since the beginning of 2014. Prospects for a quick rebound in energy and metals prices look less likely than a fly-up in agricultural commodity prices due to steady food demand growth as well as the vagaries of Mother Nature.



The slowdown in the Chinese economy has contributed to the meltdowns in metals and energy markets this year, but any fallout on agricultural commodity markets looks unwarranted to us. China may build fewer bridges and skyscrapers, but the Chinese population will not stop eating. Soybean imports provide a good example. Chinese imports are forecast to continue their steady and steep march upward. The latest USDA estimates indicate that China will import close to 80 million tonnes of soybeans this crop year, up from 77 million last year, up from just 70 million two years ago, and double the level just seven years ago.



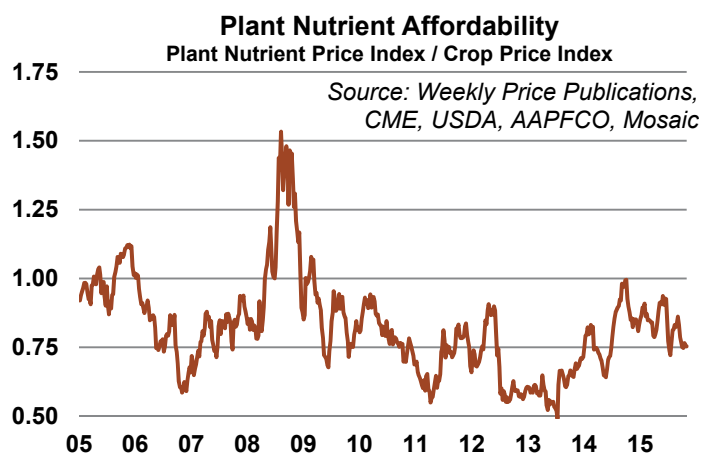
Positive P&K Demand Outlook

Some analysts project a drop in P&K demand due to the litany of concerns noted above. Our assessment is that farmers worldwide will apply more phosphate and potash to their crops this year, but some of the tonnage will come from a build of channel inventories last year.

The most recent estimates from the International Fertilizer Industry Association (IFA) indicate that farmers indeed will use more P&K this year. Forecasts released last May show that global phosphate

use is projected to increase 1.1% or 450,000 tonnes P_2O_5 this year (equal to just less than one million tonnes of DAP). That comes on the heels of a 2.5% or 1.01 million tonne gain in 2014 (equal to 2.2 million tonnes DAP). In the case of potash, use is expected to inch up 0.8% or 267,000 tonnes K_2O in 2015 (equal to about 450,000 tonnes of MOP) following a surge of 4.2% or 1.28 million tonnes last year (equal to about 2.1 million tonnes MOP).

The positive demand outlook is underpinned by strong agronomic and economic drivers. The giant step-up in global grain and oilseed production during the last three years has removed large amounts of nutrients from farm fields. Based on IPNI guidelines, we estimate that the step-up in global grain and oilseed production from roughly 2.7 to 3.0 million tonnes removed an additional 8% or 1.8 million tonnes P_2O_5 (equal to 3.9 million tonnes DAP) and an additional 7%



or 1.4 million tonnes K_2O (equal to 2.3 million tonnes MOP).

Our plant nutrient affordability metric has bobbed and weaved with changes in agricultural commodity and plant nutrient prices, but the current reading indicates that plant nutrients remain affordable and are, in fact, a better buy today than a year ago. The metric – the ratio of a plant nutrient price index to a crop price index – registered .77 at the start of the North American fall application in mid-October. That was off 15% from .90 a year ago and right between the ten-year average of .82 and the five-year average of .72. The crop price index of 170 in mid-October was up a whisker from 168 a year earlier, while the plant nutrient index registered 130, down 13% from 150 a year earlier.

U.S. net cash farm income also remains at relatively high levels despite the drop in crop prices. The latest USDA estimate shows that net cash farm income will decline 21% to \$100.3 billion this year, but that still ranks as the fifth highest ever. Accelerated depreciation programs make net cash farm income a better gauge than net farm income to measure the buying power of U.S. farmers.

But Large Channel Inventory Drawdowns

P&K shipments – or what is moved into the distribution pipeline – are expected to lag use this year because of a large build of channel inventories last year. In particular, global potash shipments are expected to decline while shipments of the main phosphate products are projected to increase just modestly this year.

The expected decline in potash shipments has attracted most of the attention. By our count, MOP shipments surged 16% or 8.7 million

tonnes to 62.7 million in 2014. Obviously, not all of that was applied to soils last year.

There are several reasons for the big jump in shipments last year. First, the distribution channel was drawn down to extremely low levels at the end of 2013 mainly due to the announcement by Uralkali on July 30, 2013 that it was withdrawing from Belarusian Potash Company (BPC) and planned to produce at capacity. This announcement for all intents and purposes halted potash movements as buyers deferred purchases until prices dropped to lower advertised levels.

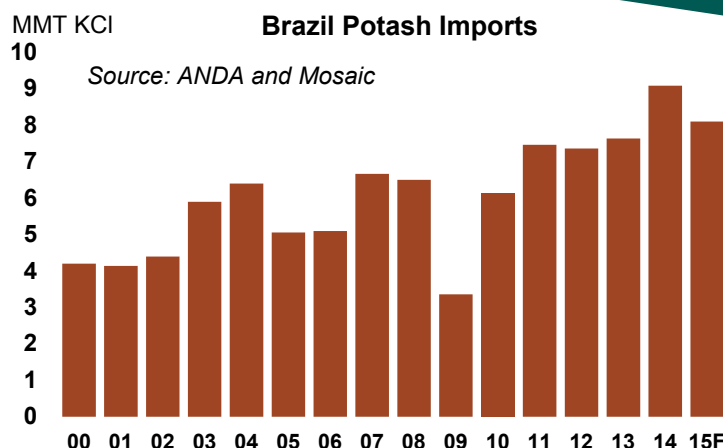
Second, an extremely severe winter and changes in railroad business models resulted in long shipping delays in North America during the first half of 2014. This caused the bizarre situation of producers throttling back production because of full warehouses while distributors at the other end of the supply chain sat with empty warehouses on the brink of the spring application season. Once trains began to roll, most distributors maintained full warehouses due to concerns about chronic shipping delays.

Third, potash prices began to recover due to the eventual surge of shipments as well as a surprising harvest rally in key crop prices. As a result, dealers stocked up early for 2015 to take advantage of expected inventory appreciation.

Finally, news broke in late November that a significant water inflow threatened operations at a 2.4 million tonne mine in Russia. This provided yet another reason for distributors to rush to secure product ahead of expected price increases. China imported more than 800,000 tonnes of MOP in December 2014, nearly double the five year average for this month. Brazil imported nearly 700,000 tonnes last December versus a five year average of less than 400,000 tonnes for the month.

The tally was nearly 63 million once all the tonnes were counted last year. So, it is no surprise that shipments are expected to decline in 2015. We project that MOP shipments will total about 59 million tonnes this year, a drop of almost 6% or 3.6 million tonnes.

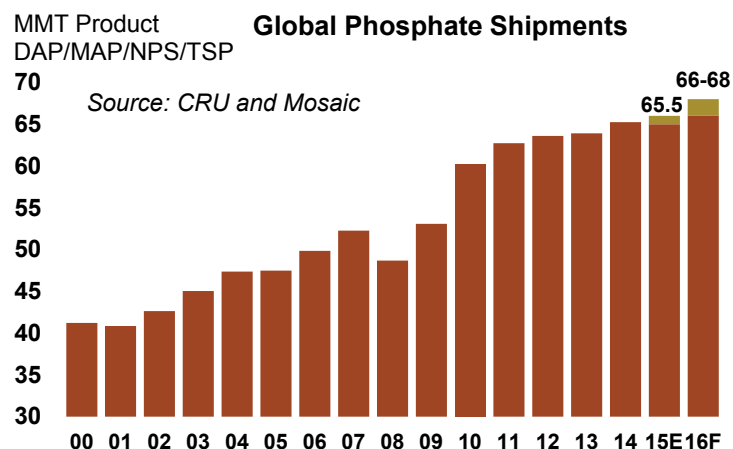
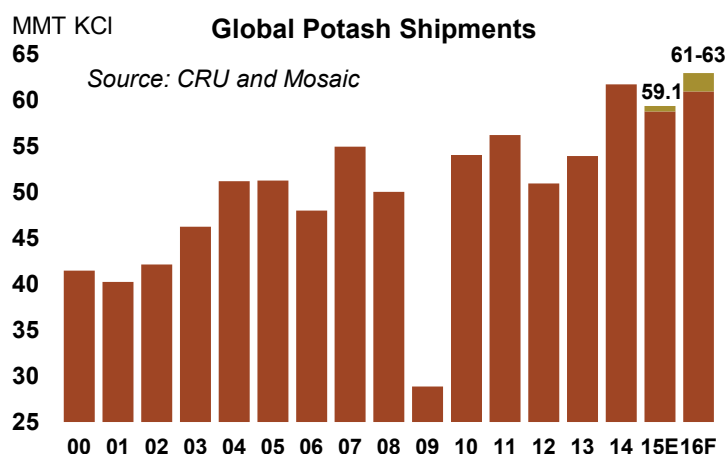
Most of the decline is expected to occur in the regions with the biggest inventory builds last year – namely North America, Brazil, Indonesia and Malaysia. Shipments in China and India are expected to increase modestly this year, but these gains will make up only a small amount of the declines elsewhere.



The large build in channel inventories last year makes for unfair comparables this year. Brazil is a good example. Market reports highlight the large drop in potash imports after trade statistics are released each month. For example, MOP imports through September were down 10% or 700,000 tonnes from the extraordinary level for the same period last year. However, the 6.3 million tonnes imported during the first nine months of this year beat the previous high mark for this period by about 400,000 tonnes. We project that Brazil will import 8.1 million tonnes of MOP this year, down a whopping one million tonnes from last year but still the second highest total ever and one-half million tonnes greater than the previous peak of 7.6 million in 2012.

Global MOP shipments are forecast to rebound in 2016 based on a continued moderate, if not spectacular, agricultural commodity prices and leaner channel inventories worldwide. In particular, we project that global MOP shipments will increase to 61 to 63 million tonnes next year with a point estimate right in the middle of this range. Gains are expected in each of the big five importing countries. North American shipments are expected to remain flat or decline slightly in 2015/16. As noted above, a three million tonne bounce in shipments next year is expected to help stabilize prices.

In the case of phosphate, the story is similar, but swings in channel inventories are not as extreme. Global shipments of the leading



phosphate products (DAP/MAP/NPS/TSP) are projected to total 65.5 million this year, up slightly more than 250,000 tonnes from our revised estimate for 2014. An expected 1.5 million tonne jump in Indian shipments this year is mostly nullified by moderate reductions in most other regions due to drawdowns of channel inventories.

Prospects for 2016 continue to look positive and our guidance of 66 to 68 million tonnes remains unchanged. Our current point estimate is 66.9 million tonnes. We expect moderate gains pretty much across the board. Shipments throughout the Americas are expected to rebound. Indian demand, a drag on global shipments since 2010/11 when changes in subsidy policies resulted in sharply higher retail phosphate prices, is

expected to get back on a strong growth trajectory during the rest of this decade.

The Strong Dollar Cuts Two Ways

The strong dollar – or more precisely the collapse of several key P&K currencies – is one of the most important and potent developments this year. Most commodities such as oil, iron ore, grains and plant nutrients are traded in U.S. dollars, and a strong dollar correlates with lower commodity prices.

In the case of potash, the one-two punch of a big build of channel inventories last year and the collapse of a handful of key currencies has put considerable pressure on prices this year. The first chart shows the price of MOP delivered to Brazil in U.S. dollars per tonne as well as the cost for local distributors in reais per tonne. Despite the drop in the dollar price from more than \$550 per tonne during the fourth quarter of 2011 to less than \$300 per tonne today, the cost in reais per tonne is the highest since the 2008 price spike. That simply is the result of the exchange rate falling from 1.80 to 3.90 reais per dollar during this period.

The second chart again shows the MOP price delivered to Brazil in U.S. dollars per tonne as well as the ruble price for a Russian exporter. The current realization of approximately 19,000 rubles per tonne is 7% or 1,300 rubles greater than the ruble price during the fourth quarter of 2011, despite the 45% drop in the dollar price of MOP.

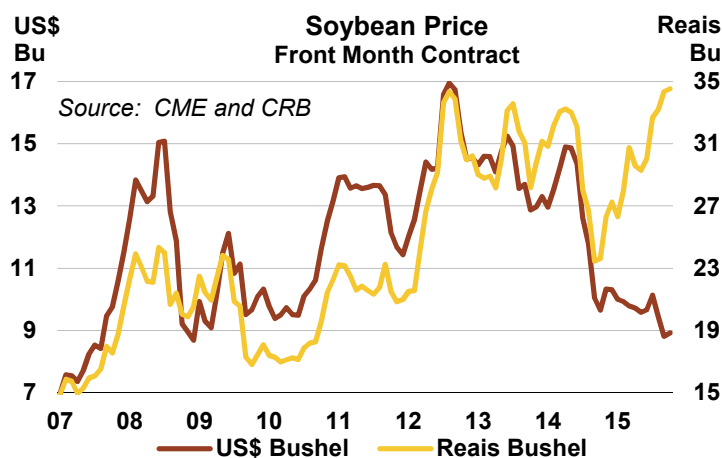
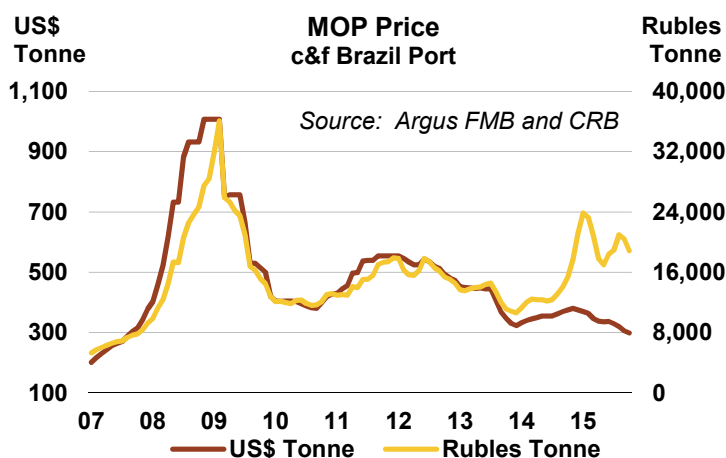
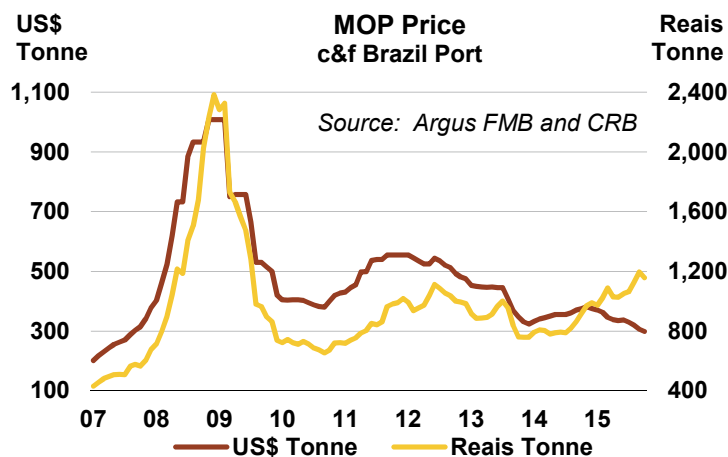
The bottom line is a strong dollar and a higher local currency cost dampens import demand while a strong dollar and higher local currency price boosts export supply (at least until inflationary pressures begin to mount). The net result is downward pressure on the dollar price of potash.

The collapse of local currencies in several of the key potash importing countries cuts two ways, however. The highly depreciated Brazilian real, Malaysian ringgit, Indonesian rupiah, and Thai baht also boost the local currency price of agricultural commodities such as soybeans, crude palm oil and rice that are exported in U.S. dollars.

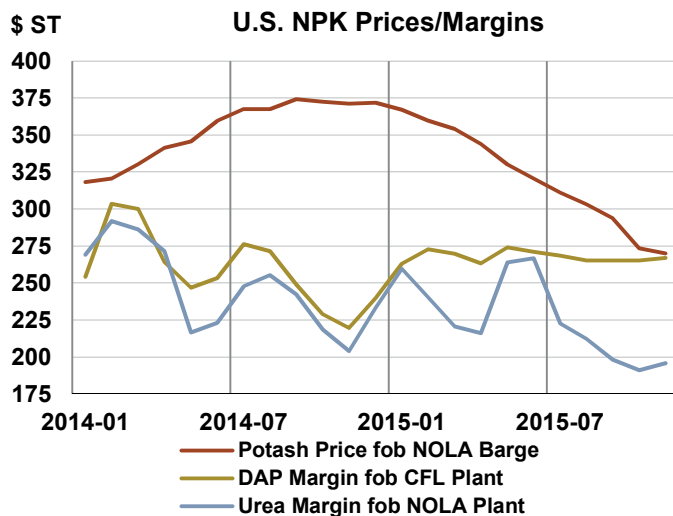
Brazil provides a good example. The chart shows that the current price of soybeans of nearly 35 reais per bushel is greater than all of the previous price spikes -- including the 2007/08 and 2012/13 Everest-like peaks. That is the result of the combination of moderate soybean prices and the collapse of the real. Brazil exports approximately three-fourths of its harvest as either soybeans or soybean meal/oil (the percentage would be even higher if meat exports were included). The increase in reais revenue generated from soybean exports far outweighs the increase in the reais cost of potash and other inputs. As a result, we expect continued expansion of planted area and the application of more technology to soybean and other crops. Brazilian agricultural prospects continue to look positive despite the current economic and political turmoil.

Steady Margins But Still No Respect

We characterized phosphate as the Rodney Dangerfield of plant nutrients in an issue of Market Mosaic several years ago. The point was that phosphate gets no respect despite positive fundamentals and the relatively steady performance of these businesses in recent years.



We have outlined the reasons why we like the phosphate business many times before: a positive long term demand outlook, the end of China's massive expansion program, few projects in the pipeline behind those of OCP and Ma'aden, improved efficiencies from the consolidation of the U.S. industry, and important product innovation. We won't get into the details here, but the relative strength of the phosphate prices and margins, particularly during the downturn in commodity prices this year, is worth highlighting.



Source: Argus FMB

The chart shows what we call the DAP stripping margin -- the difference between the fob plant price and the cost of sulphur and ammonia in a ton of DAP. The stripping margin is up significantly from the fourth quarter last year, and it has remained relatively stable in the \$265-\$275 per ton range during 2015, especially if compared to the drop in MOP prices and the recent decline in the urea margin. DAP margins have held up because declines in raw materials costs have offset any erosion of product prices. All of these estimates are based on published spot prices from Argus FMB as well as the front month NYMEX gas price.

Steady phosphate margins reflect constructive fundamentals. As noted above, shipments of the main phosphate products are expected to inch up only 250,000 this year, but several changes on the supply side of the ledger have kept the market in balance. Two U.S. facilities closed last year. The Tunisian industry continues to run at reduced rates due to disruptions caused by political unrest. Facilities in South Africa, Jordan and Mexico have had production hiccups. The Ma'aden I project has not yet ramped up to full capacity. OCP projects are running behind schedule, and the conversion of Jorf Lasfar acid plants from dry to wet rock continues to take some capacity offline. China is supplying the growth in demand as well as making up for the shortfall from other producers this year. Chinese exports are projected to surge to 9.5 to 10.0 million tonnes of DAP/MAP/TSP this year, up from just less than 8.0 million last year.



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