China’s efforts to improve sustainability
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All nutrients fertilizer demand over time – source comparison

- IFA
- National Bureau of Statistics
Phosphates

### DAP/MAP apparent demand

- **DAP**
- **MAP**

- **Mn t P2O5**

#### Other P straight

#### Other NP

#### NPK

#### PK

#### SSP

#### TSP

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### Mn t P2O5

- **MAP**
- **DAP**
- **Other NP**
- **PK**
- **NPK**
- **SSP**
- **TSP**
- **Other P straight**

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Potash

**MOP apparent demand**

*Graph showing Mn t K2O with MOP demand from 2000 to 2015.*

**Mn t K2O**

- **MOP**

*Graph showing Mn t K2O with various types of demand from 2000 to 2015.*

- **MOP**
- **SOP**
- **NOP**
- **NK**
- **NPK**
- **PK**
- **SPM**
Adjusting for improving crop yield, we are starting to see an increase in use efficiency.
Why? A clear shift in government policy

- China’s GDP increased from 4th in 2006 to 2nd in 2014
- However, the environment index (EPI) ranking decreased from 94 to 116/132 in 2012.
- According to China Environment Report 2013, more than 25% of lakes have eutrophication. More than 50% of ground water has been polluted.
- According to the China 1st Soil Pollution Report, more than 16.1% of total soil test samples were polluted exceeding standard requirement.

Shift in government policy
- On 17th February of 2015, the Ministry of Agriculture published “Action Plan for Fertilizer Consumption Zero Growth Rate by 2020”.
- The result has been a big push from the Chinese government to reduce fertilizer consumption and improve use efficiency through a plethora of measures:
More balanced nutrient use, better performing products, micronutrients
China is much less reliant on nitrogen

- China has more balanced macro nutrient use.
- Low analysis products are being substituted for by high analysis.
- More compounds, nitrate-based and SOP-based NPKs where appropriate (and sometimes not!).
- And this extends to greater use of micronutrients.
- And importantly, soil testing is being used much more extensively.
China is also adopting better performing specialty fertilizer products

**Water solubles:**
- Mainly used on fruits and vegetables
- China has doubled fertigation area in the last 5 years.
- Increasingly diverse group of producers

**S&C release:**
- Significant capacity in China, utilization thought to be about 50-60%
- Significant promotion by the state and by the main producers.
- Consumption has extended beyond cash crops to grains.
- However, relatively high price is still seen as a hurdle for further growth

**Selected estimates of China specialty fertilizer production**

![Bar chart showing China specialty fertilizer production](chart.png)
There are various nutrient efficient/saving state programmes impacting nutrient use

- From 2016, the Ministry of Agriculture issued “Plan of Pilot Scheme for Farmland Rotation and Fallow”. The pilot area for crop rotation and fallow is in the table below. The project has been mainly in the nine provinces, including Inner Mongolia, Liaoning, Jilin, Heilongjiang, Hebei, Hunan, Guizhou, Yunnan and Gansu.

<table>
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<th>The pilot area for crop rotation and fallow, thousand ha</th>
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<tr>
<td>Pilot area</td>
</tr>
<tr>
<td>2016</td>
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<tr>
<td>-------</td>
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<td>410</td>
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- On 10th February of 2017, the Ministry of Agriculture issued “Action Plan for organic fertilizer replacing chemical fertilizer on fruit, vegetable and tea”. The Plan required that chemical fertilizer consumption should reduce by more than 20% by 2020 in dominant production areas and more than 50% in key area or famous brand areas.

- In November of 2015, the Ministry of Agriculture issued “Corn Structural Adjustment Guidelines in Sickle-bend areas”.
  - Related to the decision to reduce maize support.
  - As the result, corn sown area reduced by 1.36 million ha in 2016. In 2017, the national corn sown area continued to decline by 3.6%.
There is a drive toward better resourced, more sophisticated agricultural practice

- Small farm holders are joining cooperatives to make the collective unit bigger, benefitting from scale economies.
- Application equipment is improving, and more farmers are getting access to better equipment
  - Big suppliers like Sinochem are cooperating with banks to supply finance.
  - Some companies like Alibaba also looking for the opportunity to invest in agriculture.

Fertilizer supplier business models are radically changing.
- Farmers are becoming better educated about application practices. Many education programmes from government, major suppliers like Sinochem, and retailers.
Fertilizer has become more expensive and crop price support is reducing

- Removal of export tariffs which led to surge in urea, DAP and MAP exports led to an increase in China fertilizer prices, relative to international prices.
- Pressure on the supply side leading to tighter S/D balance
  - Strict environmental protection, closing down the low-efficient, high pollution factories, making the fertilizer price going up, and keep in higher level, but the agricultural products price is not going up in a same level the fertilizer products, also impact the farmers to buy less fertilizer and make the application more efficient.
- Government support for crop prices is reducing.
  - Best example is maize.