

Fertilizer Policy in Thailand

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INTRODUCTION

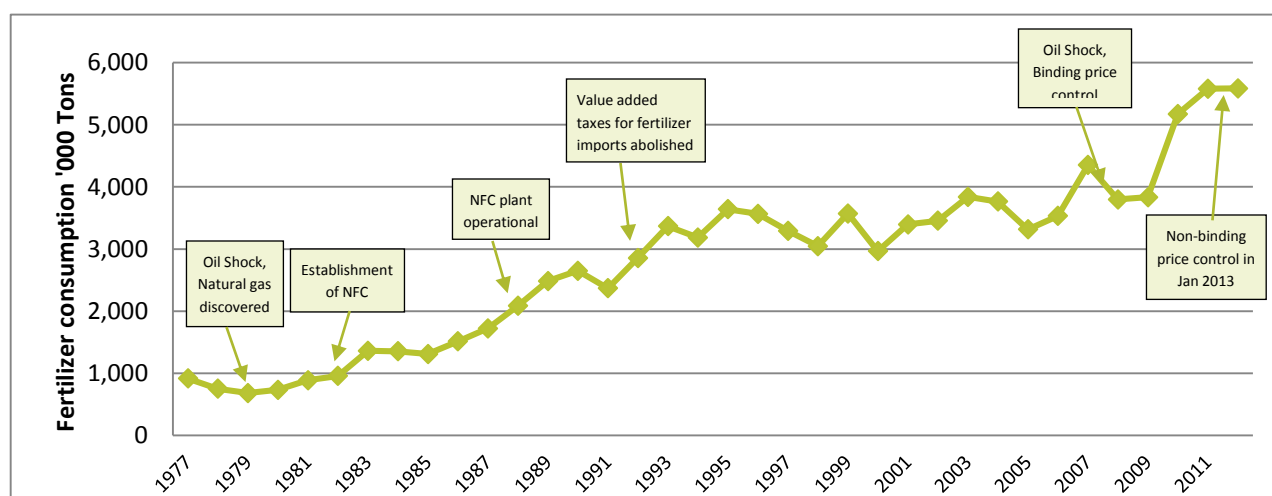
Fertilizer use in Thailand has become an integral part of agriculture due to the declining availability of arable land and the increasing role of rice and other agricultural exports in the economy. Approximately 47 percent fertilizer is used on rice, production of which has increased from 13.4 million MT to 36 million MT from 1970 to 2010 coinciding with a rise in fertilizer consumption from .2 million MT to 2.6 million MT. However, Thailand has a limited supply of raw materials for fertilizer and therefore imports both raw materials and pre-compounded grades for domestic production and distribution. This brief reviews the Thai fertilizer sector and the changes in policy which have led to its growth.

FERTILIZER POLICY

Fertilizer production began in Thailand in 1960 when the government established the Chemical Fertilizer (CF) plant of which it controlled 50 percent in order to produce urea and ammonium sulfate. To protect the plant from competition, the government banned imports of these two products in 1968 leading to a price spike of the two fertilizers and the import of single-nutrient nitrogen fertilizer for mixing to circumscribe the ban. In 1970 the government banned all single-nutrient nitrogen fertilizer imports as well to further protect the plant but the ban did not last the year as the plant was not able to keep up with demand.

The Board of Investment's decision to place an import duty of 20 percent on fertilizer in the 1970s raised prices of nutrients further and suppressed fertilizer usage. It was not until the mid-1980s that duties were relaxed and Thailand transitioned to a more open trade policy. Further liberalization came in the early 1990s with the abolition of value-added taxes. The removal of these two barriers was in part responsible for the 8 percent average growth in fertilizer use from 1986-1993. Currently, government intervention is limited and fertilizer prices are generally closely correlated (93.8 percent) with world fertilizer prices.

Figure 1—Timeline of Thailand's major fertilizer policies and events



This being said, the government did not wholly remove itself from the fertilizer sector during the liberalization period of the 1980s. In 1982 the government established the National Fertilizer Corporation in order to displace imports as a result of the world oil shock and the discovery of oil in the Gulf of Thailand. The NFC plant was operational in 1988 but struggled to compete with duty-free fertilizer imports. The depreciation of the baht in 1998 led to a government bailout in order to repay debts and by 2004 the company was forced to close its doors and stopped producing fertilizers.

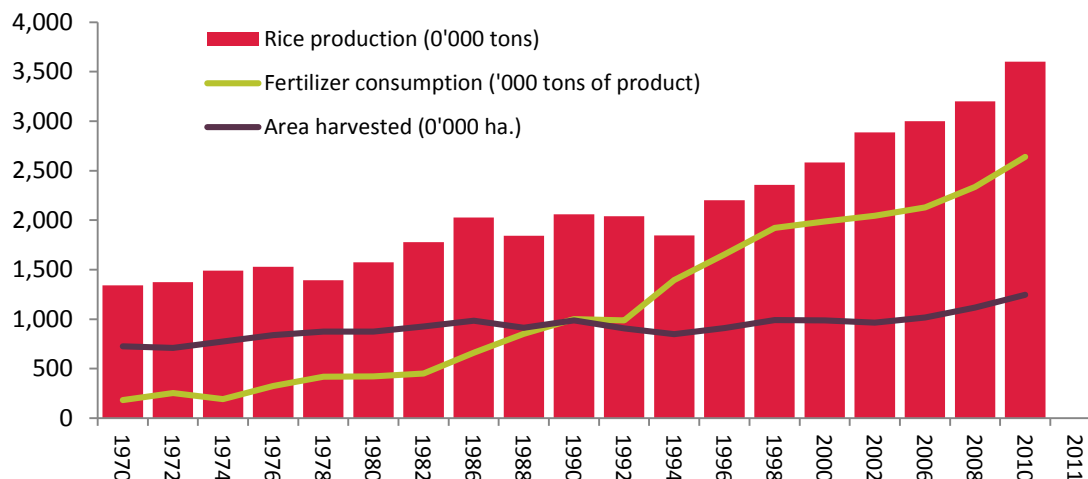
The government continues to monitor and occasionally intervene in the fertilizer market, even as recently as 2008. During the fertilizer crises, the government prevented private retailers from rapidly increasing their prices on four rice fertilizer grades and imposed a price ceiling on fertilizers. While the impacts of the price ceiling were said to be modest during interviews with retailers, the monitoring done to control fertilizer prices imposes numerous burdens on retailers. Each month wholesalers and retailers are required to report their set prices, remaining stocks, locations, conditions of storage, and other indicators to the government. Importers and producers are also required to report their names, brand names, nutrients, purchased, imported, production, quantity sold, remaining stocks, locations, storage conditions, set prices, and operation costs to the government.

Because operating in the formal fertilizer market is cumbersome and subject to government price controls, the market is frequently flooded with uncontrolled informal fertilizers of various grades and qualities. Some of these match the quality of regulated fertilizer but circumscribe the regulation process while others are of low quality. Price control mechanisms have also affected the composition of the market such that the share of foreign manufacturers relative to domestic firms has decreased due to their unwillingness to operate in such a poorly governed and fluctuating market.

FERTILIZER USE AND EFFICIENCY

According to the Office of Agricultural Economic Records, fertilizer use has increased at an average rate of 9 percent annually from 1970 to 2010. Farmers now use an average of 162 kg/ha of fertilizer for all crops and 221 kg/ha of fertilizer for rice.

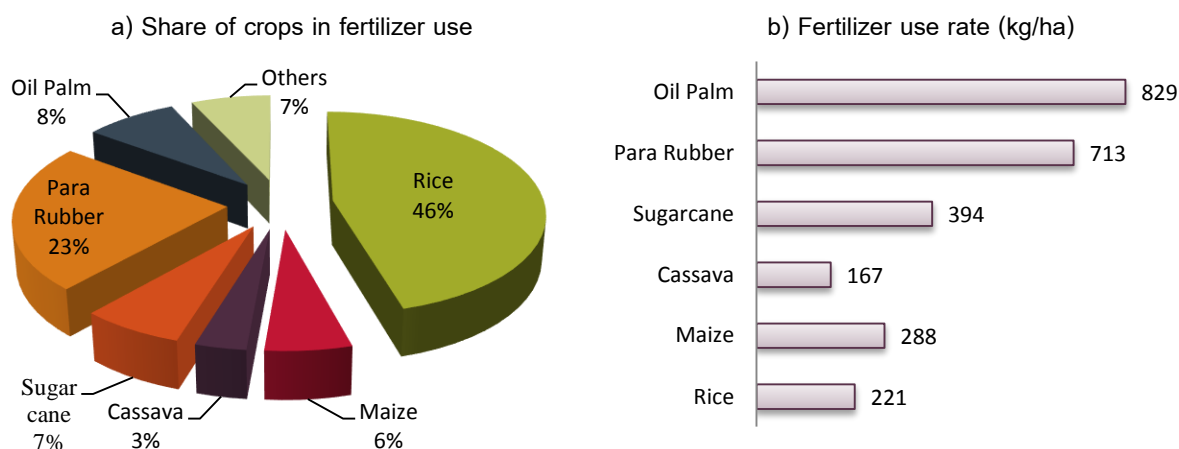
Figure 2—Production, area harvested, and fertilizer consumption for rice in Thailand, 1970-2010



Source: Office of Agricultural Economics

Most of the soil in Thailand is nitrogen deficient due to the dominance of rice crops, thus nitrogenous fertilizers are the most commonly used, especially urea. Approximately 44 percent of fertilizer imports in 2012 were urea, which is widely used as a top-dressing. Other fertilizers such as potash, DAP, and ammonium sulfate account for far less at 11, 8, and 6 percent of imports, respectively. Plantation crops such as oil palm and rubber use fertilizer the most intensively but, rice crops alone accounted for 46 percent of total fertilizer consumption.

Figure 3—Fertilizer usage by crop



Source: Office of Agricultural Economics

The fertilizer input/output ratio for rice is about 5:1, while the rice-fertilizer price ratio is around 3, implying that the application of one kg of fertilizer nutrient will increase yields by approximately 3 kg. The average Value Cost Ratio (VCR) is 1.6 which, according to Kelley et al. (2006), is below the threshold amount necessary to incentivize adoption in developing countries when taking into account the risks and capital costs inherent in most farming systems. In the Thai case where fertilizer is readily used, this ratio may imply low profitability of using additional fertilizer.

Table 1—Rice: fertilizer use, production, input/output ratio, input/output price ratio, value cost ratio

Year	Rice Production (kg/ha)	Nutrient Input (kg/ha)	Output-Input Ratio (O/I)	Input-Output Price Ratio (Pi/Po)	Value Cost Ratio
2005	2997.5	96.9	4.9	3.9	1.3
2006	2950.6	96.3	4.5	3.9	1.1
2007	3044.4	94.4	5.6	2.5	2.3
2008	2996.9	98.1	4.9	4.7	1
2009	2908.1	96.3	4	3	1.3
2010	2970.6	101.9	4.4	2.6	1.7
2011	3188.8	101.9	6.6	2.7	2.4

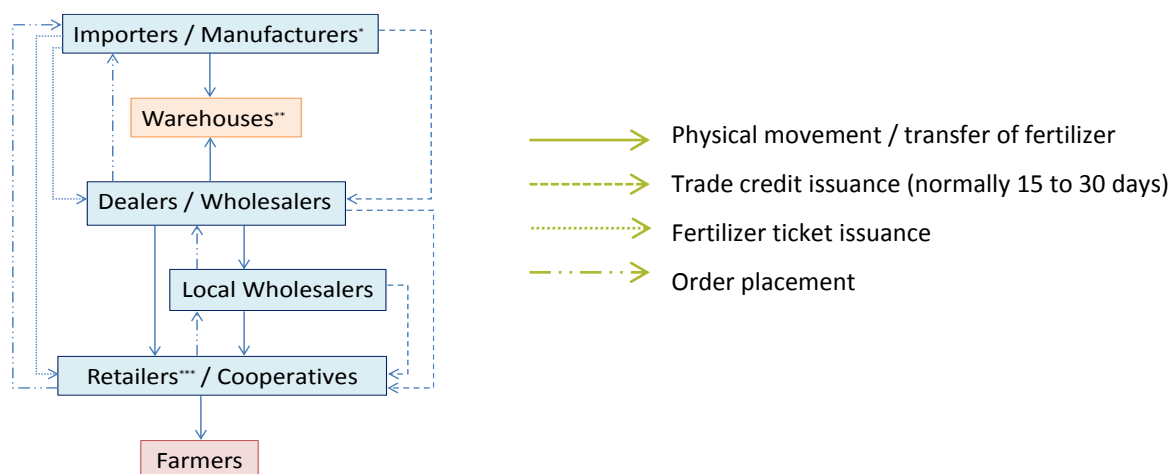
Source: OAE

MARKET STRUCTURE AND PERFORMANCE

Thailand no longer has a fertilizer producing plant, but it does have several mixing plants for various fertilizer grades. These plants can blend 10-30,000 MT/day and use straight or compound fertilizer as raw materials. Generally, manufacturers produce a variety of products including blended, granulated, and fertilizer liquids with the imported materials.

The wholesale markets for fertilizer trade through “fertilizer tickets”. These tickets are issued to fertilizer wholesalers instead of manufacturers selling products in the spot market. The tickets specify the date and place where the wholesalers can receive their order. There is usually a 30-60 day period where the manufacturers provide credit to the wholesalers. The issuance of credit has proven to be an effective mechanism for manufacturers to gain loyalty from the wholesalers. It is common for a few brands to dominate a certain region because of this. Wholesalers receive their orders using the ticket system and can sell the fertilizer to retailers through credits. Similarly, retailers sell fertilizer to farmers through the credit system.

Figure 4—Domestic fertilizer supply chain



Source: Authors

The fertilizer ticket market functions similarly to a forward market allowing manufacturers to plan imports and effectively estimate future prices. As such, manufacturers and wholesalers better estimate the timing and grades to import in order to coincide with the growing season allowing the manufacturers and wholesalers to avoid over- and under-stocking for the market. The fertilizer ticket system helps stabilize the fertilizer market such that shortages and excesses only occur when there are policy interventions or spikes in oil prices.

The size of the fertilizer market is 5-5.5 million MT and consists of approximately 90 importers and manufactures. That said, the sector is oligopolistic with the top three firms controlling as much as 60 percent of the market based on interviews with experts. The two largest firms, Jia Tai and Thai Central Chemical have the capacity to produce over 1 million MT of fertilizers per year, which is over half of the fertilizer market.

Table 3—Fertilizer market shares in 2012, categorized by type

Rank	Single-nutrient		Compounded		Bulk Blended	
	Firm	Share (%)	Firm	Share (%)	Firm	Share (%)
1	Jia Tai	50	Thai Central Chemical	40	ICP	25
2	ICP	10	Jia Tai	20	Hydro Thai	20
3	Sumi-Thai	10	Yara	10	World Fert	15
4	Thai Central Chemical	8	Terragro	10	Mahawong	10
	Others	22	Others	20	Others	30
Market Size*		1.7 million tons	1.8 million tons		0.7 million tons	

The single-nutrient market consists of urea, ammonia sulfate, DAP, and MOP. Jai Tai control the single-nutrient fertilizer market because it has access to high quality urea from Russia. In the compounded market Thai Central Chemical is the most dominant firm. Its main product is the 16-20-0 grade and production capacity of all of its fertilizers is 0.7-0.8 million tons a year. There is free entry into the single-nutrient and compounded fertilizer markets, but this entry is costly since existing companies have brand loyalty and a reputation for quality. Additionally, existing companies deter new entrants by adopting a price cutting strategy. The top four companies control approximately 70 percent of the bulk blended market but while oligopolistic, there is competition amongst the four.

The price control laws make it difficult for manufacturers to directly adjust their prices, therefore, manufacturers compete by giving trade credits and discounts to wholesalers. Popular grades, such as 46-0-0 and 16-20-0 are much more competitive and have lower profit margins compared to the 21-0-0 and 15-15-15 grades. However, three forms of non-price competition also exist. The first is product differentiation whereby existing products are modified by adding more nutrients or micronutrients. This form of non-price differentiation is more prevalent in niche fertilizer markets. The second form of is promotional activities/events held by manufacturers in specific areas. This is done in lieu of giving discounts to wholesalers and puts the product directly into the hands of the farmers. The third form is competition for brand loyalty. Farmers tend to choose a brand and stay with that brand. For example, Jia Tai's reputation as having the best quality has helped it maintain its dominance of the urea market.

CONCLUSION

The fertilizer sector in Thailand has over time moved from one which was strongly controlled to one which is partially liberalized. This has coincided with a rapid increase of fertilizer usage, imports and private industry development. While the market is by no means completely free and transparent it in many cases operates efficiently and farmers are able to access a variety of products from simple urea to more complex blended specialty products. The continued interference and regulation imposed by the government has created a parallel informal market for fertilizers but further liberalization, quality monitoring, and farmer education will help to remedy this problem.

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