



# RTB Working Paper

## Cassava market update and short-term outlook

**2018**

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and Bananas



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# Summary

The regional cassava market has experienced a rapid recovery from the low prices of 2016-17 in the last 12 months. By the second half of 2017 a supply shortage became apparent and prices rapidly increased, with starch price FOB Bangkok peaking at \$540/t in June 2018. The reduction in supply was caused by several factors, including a reduction in planted area due to the very low prices in the previous year, flooding in key production areas of Thailand, and some disease pressure in Cambodia and Vietnam beginning to appear. It is apparent that access to reliable and timely production data is lacking with the exception of Thailand where crop assessments are done within the season. The project is often contacted by industry stakeholders looking for insights into production levels in main producing countries illustrating the demand for more real time data for decision making.

Given the dominance of the **Chinese market**, changing production and trade policies in continue to influence the market demand for cassava. The divergence between US and Chinese maize reappeared soon after a brief period of alignment as policy makers attempt to achieve structural adjustment of the corn sector without incomes of farmers declining before this adjustment occurs. Rabobank still forecasts over 230 million tons of stocks for 2017/18. According to the USDA estimates of when stock will return to normal levels range from 18 months to 7 years. Emerging trading relationships between US and China will add a level of uncertainty to the carbohydrate market and demand for substitutes.

The fresh root price in **Thailand** (benchmark price at 25% starch) drop from 70 USD/t in early 2015 to below \$50/t in April-June 2017 (last annual report). In the past 12 months the fresh root price surged to \$96 USD/t before finishing at around \$86 in July 2018. These were the highest prices experienced since 2010 during the mealybug outbreak in Thailand that significantly reduced production before control measures were implemented. Fresh root prices in **Vietnam** continue to vary significantly between the north, central and southeast. Competitions for feedstock between starch producers is high in **Tay Ninh** pushing up prices to over 3000 VND/kg (over \$130 USD/t) peaking at around \$150/t (30% starch content). The Tay Ninh market processes a large share of Cambodian roots from the eastern Provinces where CMD is becoming widely established that will add additional pressure to supplies. Prices in **Daklak** were also considerably higher than the previous 12 months with prices around 2,700VND/kg (\$117/t). There are new processing factories for starch and ethanol competing for roots compared to when the project began. In previous years the only competition for feedstock in **Son La** was the dry chip market, however a new starch factory began processing in 2017-18. Prices reached over \$92/t towards the end of the processing season.

Prices at the factory gate in Lampung - the main starch production region of **Indonesia** - followed the Thai market to lows below \$40 USD/ton in late 2016. It is important to remember that farm gate prices are lower based on transport costs and farmers and traders are subject to a 'refraction' based on root quality. The market rebound in close correlation to the Thai market with prices

reaching \$100/t. In **North Sumatra**, price at Bumi Sari starch factory fell from around 1000IDR/kg (\$75USD/t) in early 2016 to around 575IDR/kg (\$43 USD/t). This impacted the area planted in the subsequent season with many farmers choosing to grow alternative crops such as maize. The company had insufficient root supplies to meet starch orders and were filling key orders through starch purchases. Similar to other sites, the shortage of supply in the local area compounded by the regional prices meant prices surged in 2018. In April prices had reached 1,200IDR/kg and continued to 1,450IDR/kg (\$100 USD/t) in July 2018. Smaller processors had to offer a premium above this to attract supplies.

Despite falling prices, Vietnamese cassava exports remained at all-time high levels in 2017. However, export volumes for Thailand and Vietnam are down to date in 2018 as supply contracted. Indonesia remained the second largest importer of cassava starch, but despite Thai cassava starch becoming relatively cheaper than domestic Indonesian cassava starch, imports have remained relatively weak. This is due to cassava starch becoming more expensive than corn-based substitutes. Cassava-based sweetener manufacturers have become less uncompetitive against corn syrups from the US, China and India. Processors have at times imported corn based sweeteners to fill orders rather than process starch to produce themselves.

There has been a major decline in the quantity and value of cassava chips exported from Vietnam. Thai cassava chips are almost exclusively exported to China whereas Vietnam exports a small proportion to other East Asian countries. The high costs of cassava roots and low oil prices put pressure on **biofuel** manufacturers using cassava as a feed stock. The reduction in the price of cassava roots made biofuel production more viable for a few months, but the resurgent cassava price will again put pressure on biofuel producers and the ability for governments to achieve mandates.

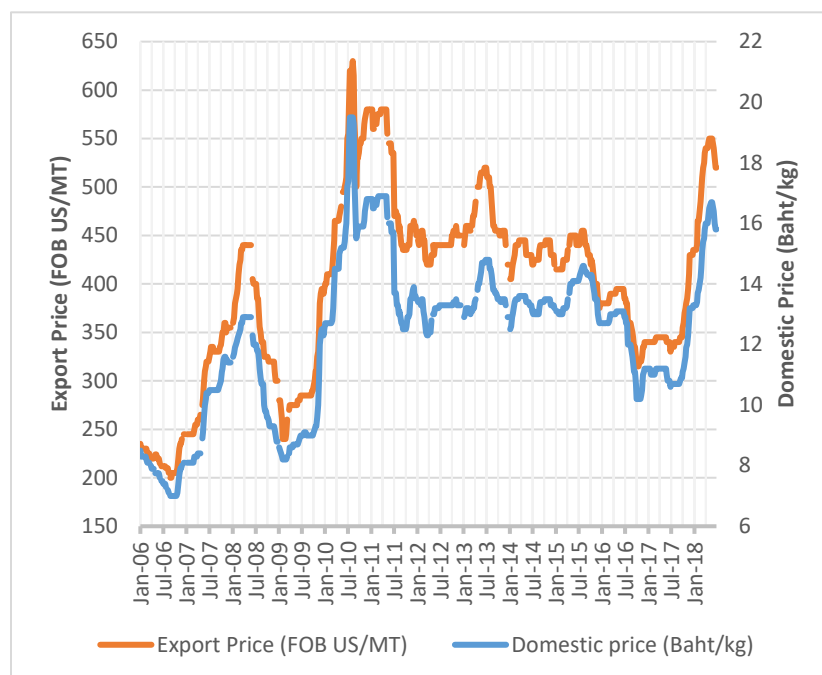
Prices in **Lao PDR** towards the end of the processing season had reached over \$100 USD/t in parts of Xayabouli and between \$75-85 in Central and Southern Laos. In eastern **Cambodia** the prices at collection points closely reflect the prices in Tay Ninh minus the transport and logistic costs. Eg. In April 2018 the prices reported at collection points were: Stung Treng - \$87 USD/t; Kratie:\$100 USD/t ; Kampong Cham: \$113 USD/t; Tboung Khmum: \$125-133 USD/t at a period when the price in Tay Ninh at the starch factory was \$145/t. Root prices in Myanmar have not seen the same level of recovery with farmers receiving around \$55/t in April.

Trade data for Laos and Cambodia is inferred from the import statistics of Thailand and Vietnam that are reported on a monthly basis (Vietnam only reports value not volume). The majority of cassava produced in Eastern Cambodia is transported to Vietnam where it is processed by the large capacity in Tay Ninh Province. Despite the higher prices, the import value from Cambodia to Vietnam to-date have been down close to 50% compared to 2017. However, the higher prices resulted in early harvest in of the 2017-2018 crop. In western Cambodia exports largely into Thailand, however the form is usually dry chips rather than fresh roots. Thai imports of roots and dry chips are also down 34% in terms of volume and 27% in terms of value compared to 2017 (data for May). There is major focus within Cambodia in developing processing capacity within the country to process starch domestically with several new foreign companies investing in the past 12 months.

The Lao value chain for fresh roots and chips is also largely influenced by Thailand and Vietnam, although there is some export of starch directly to China by Chinese owned factories. Similarly, factories with Vietnamese or Thai ownership export back to their respective countries. In Xayabouli Province there remains considerable fresh root trade out of Kenthao District for processing in Thailand or processing into dry chips prior to export to Thailand. The starch processor in Paklai District continues to operate largely as a monopsony within Paklai with exports going directly to China. The value chain within project villages in Bolikhan has shifted towards domestic starch production (Vietnamese owned company) and the new starch processor in Viengthong District accounts for a larger share of production than when the value chain assessments were conducted.

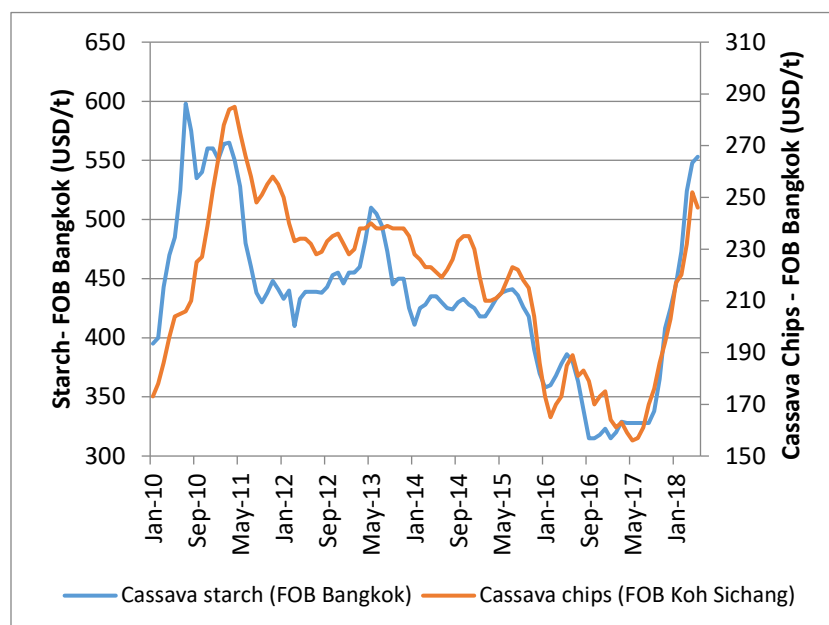


## MARKET INFORMATION



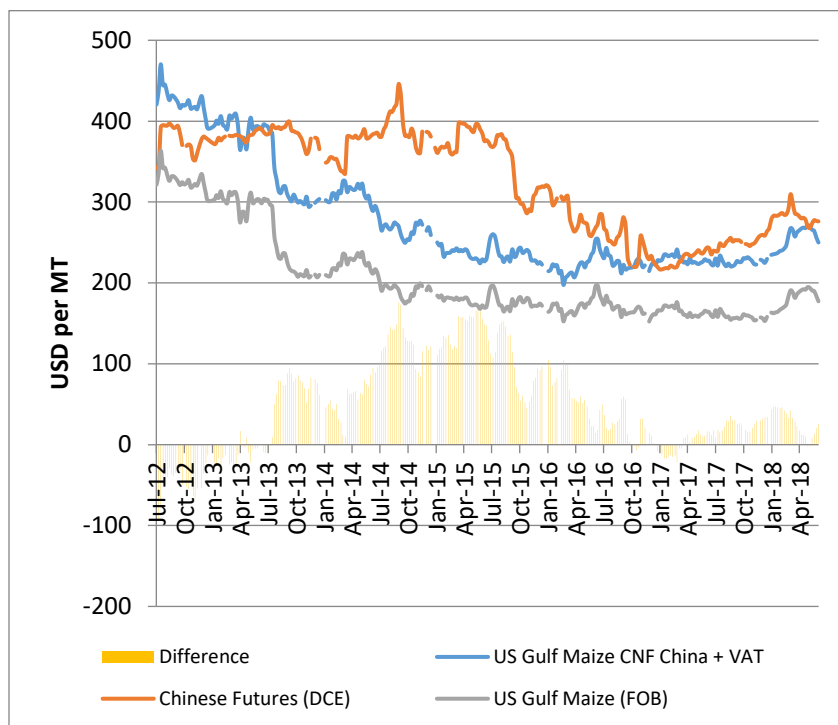
**Fig 1** – Thai Domestic and Export tapioca starch price.

Starch prices fell from around \$450USD/t in 2015 to a low of \$315USD/t in Sept-Oct 2016. By mid-2017 a supply shortage became apparent and prices rapidly increased, peaking at \$540/t in June 2018. The reduction in supply was caused by several factors, including a reduction in planted area due to the low prices in the previous year, flooding in production areas of Thailand, and some disease pressure in Cambodia and Vietnam. Changing production and trade policies in the maize and feed sector in China and Thailand continue to influence the market demand.



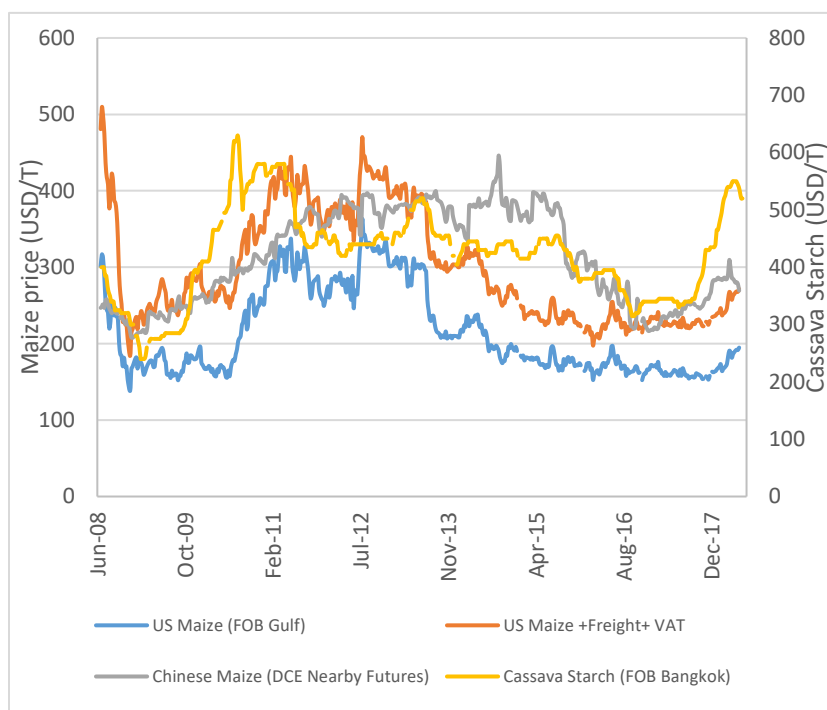
**Fig 2** – The price of cassava chips and cassava starch (tapioca).

Thai export prices of both commodities were up significantly for the 2017-18 harvest, although volumes of trade were down resulting in lower total export value.

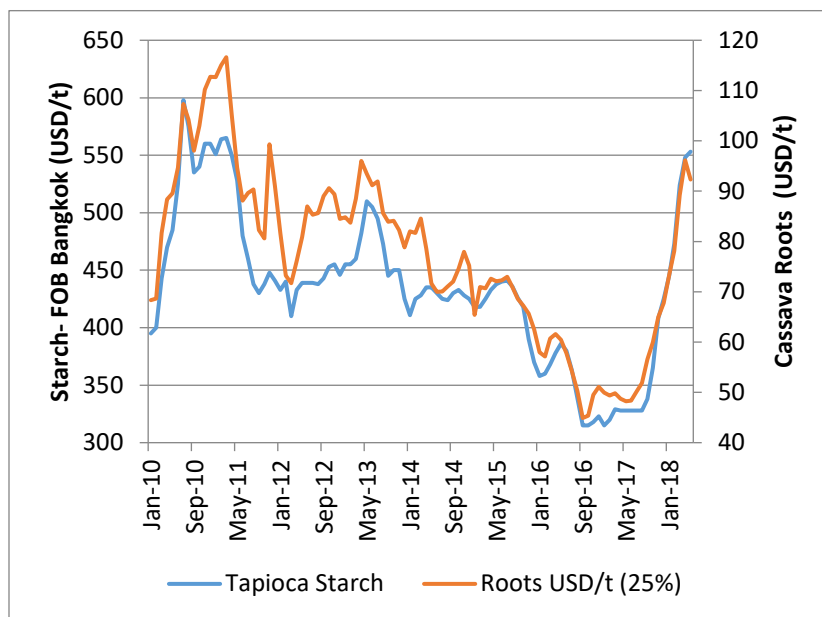


**Fig 3 – Chinese and US maize.**

The removal of Chinese maize price support saw the price of cassava products fall significant in SE Asia with Chinese domestic maize more closely reflect the import parity price during 2017. Divergence reappeared soon after as Policy makers attempt to achieve structural adjustment of the corn sector without incomes of farmers declining before this adjustment occurs. Rabobank still forecasts over 230 million tons of stocks for 2017/18. According to the USDA estimates of when stock will return to normal levels range from 18 months to 7 years.

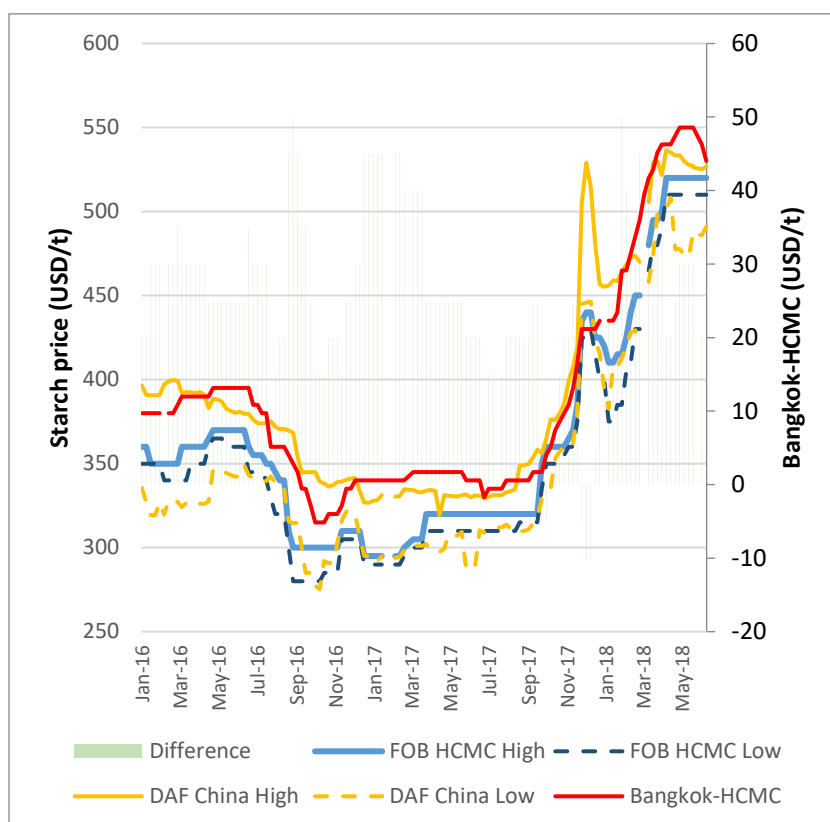


**Fig 4 – Weekly maize price (FOB US Gulf, FOB Gulf+ Freight to China + VAT, Nearby Futures (DCE) and Cassava Starch Price (FOB Bangkok). Cassava starch prices now trade at a significant premium.**

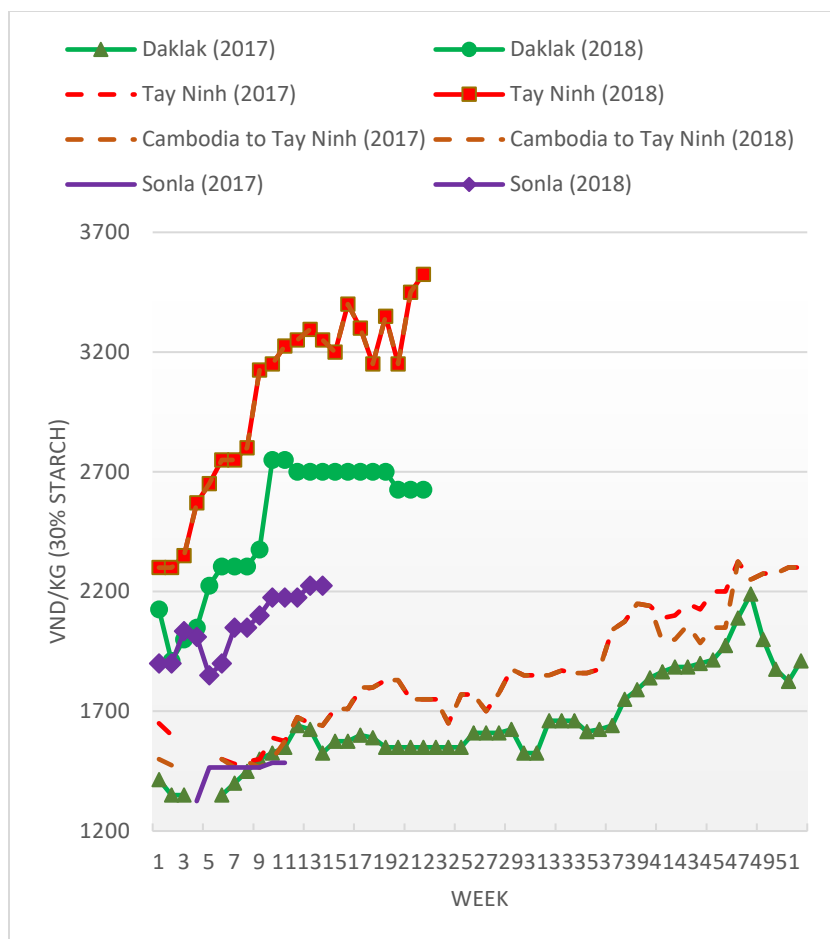


**Fig 5** – Impact on root prices.

The fresh root price in Thailand drop from 70 USD/t in early 2015 to below \$50/t. Previous highs in 2010 were during the mealybug outbreak in Thailand that significantly reduced production before control measures were implemented. Prices have been at the highest level since this crisis with another potentially around the corner.

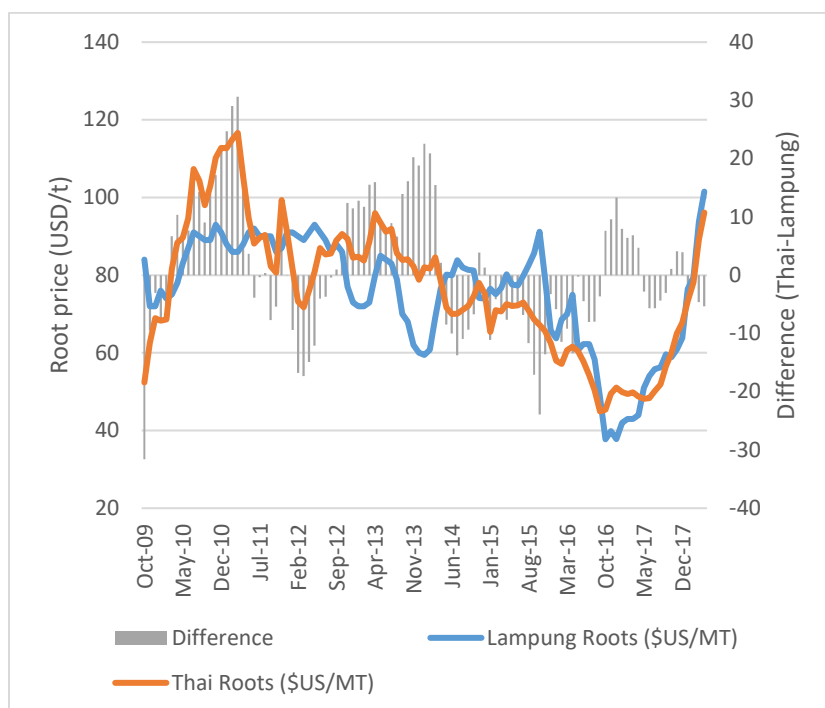


**Fig 6** – As the benchmark cassava starch price (FOB Bangkok) rebound the FOB HCMC price followed trading at a \$30-50 discount. There is significant spread for the DAF prices quote at the Chinese Border (Mong Cai/Lang Son) which is how much of the starch makes its way into southern China.



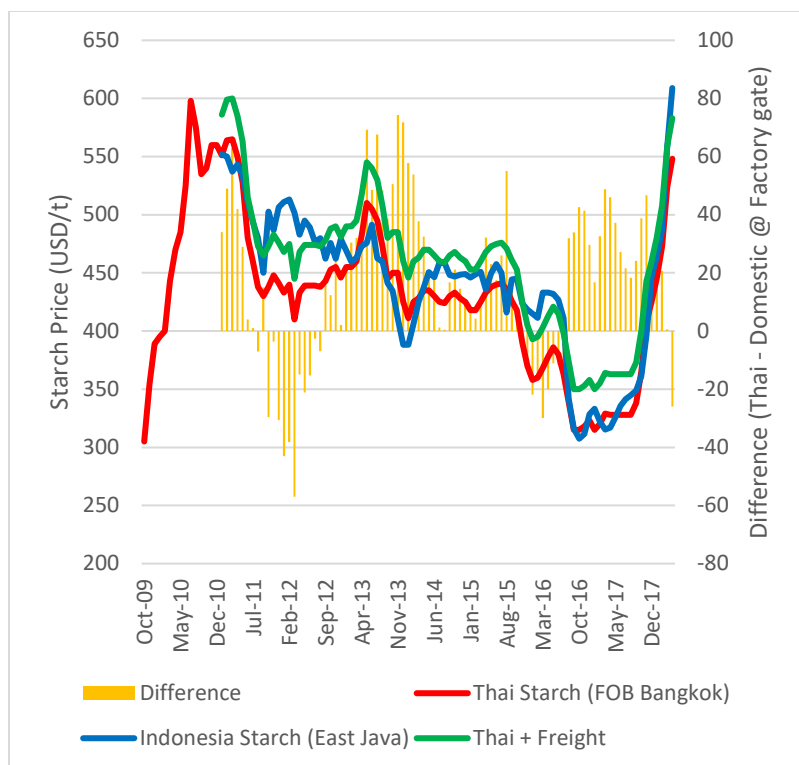
**Fig7** – Weekly fresh root prices in Vietnam in 2017 – June 2018.

Price in Vietnam continue to vary significantly from the north, central and southeast. Competitions for feedstock between starch producers is high in Tay Ninh pushing up prices. In previous years the only competition for feedstock in Sonla was the dry chip market, however a new starch factory began processing in 2017-18. Factory prices in TayNinh peaked at over \$150/t (30% starch).



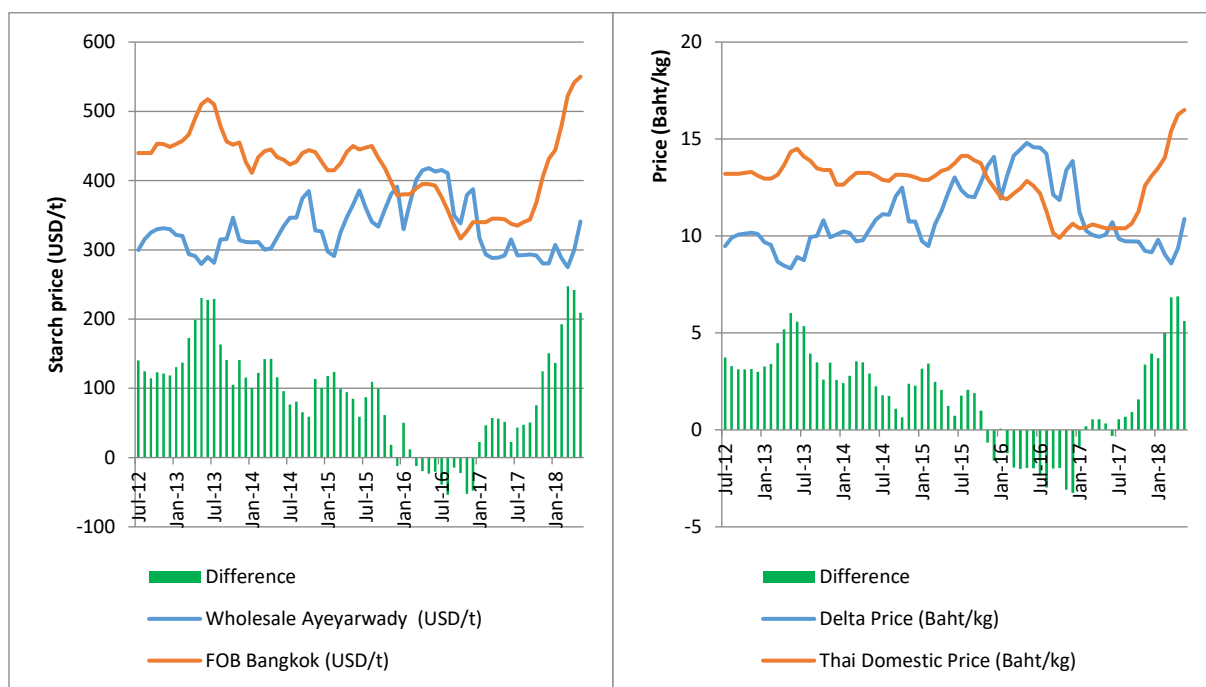
**Fig 8** – Cassava Fresh root prices in Lampung, Indonesia.

Prices at the factory gate in Lampung followed the Thai market to lows below \$40 USD/ton. It is important to remember that farm gate prices are lower based on transport costs and farmers and traders are subject to a 'refraction' based on root quality. The market rebound in close correlation to the Thai market with prices reaching \$100/t.

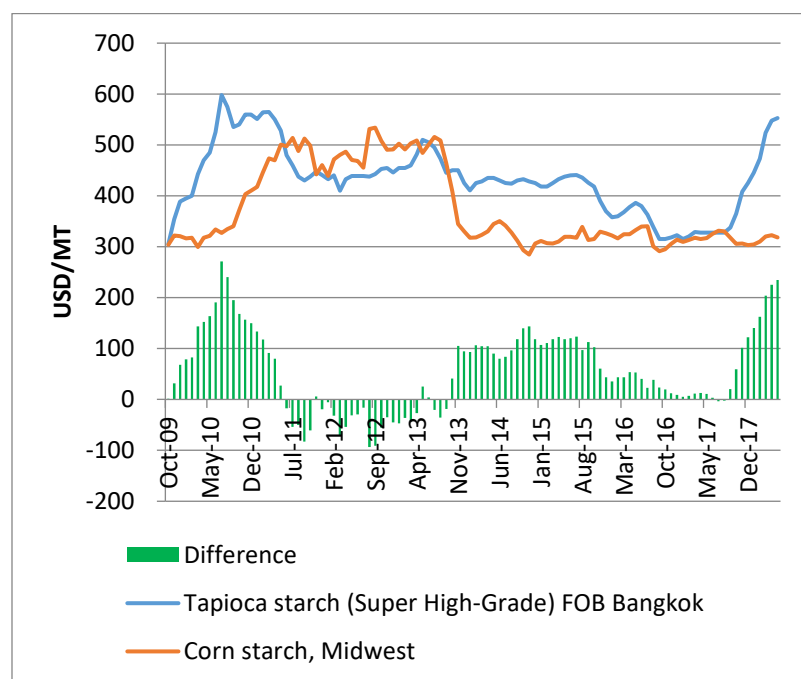


**Fig 9** – Thai and Indonesian starch prices.

The cost of Thai starch delivered to factory gate in East Java compared to Lapung starch delivered factory gate in East Java. During periods when domestic starch becomes more expensive relative to imported starch, deep processors such as sweeteners manufacturers import from the world market (Thailand and Vietnam). High Indonesian imports can be seen in 2012 and 2015-16 (Fig 16 & 17).

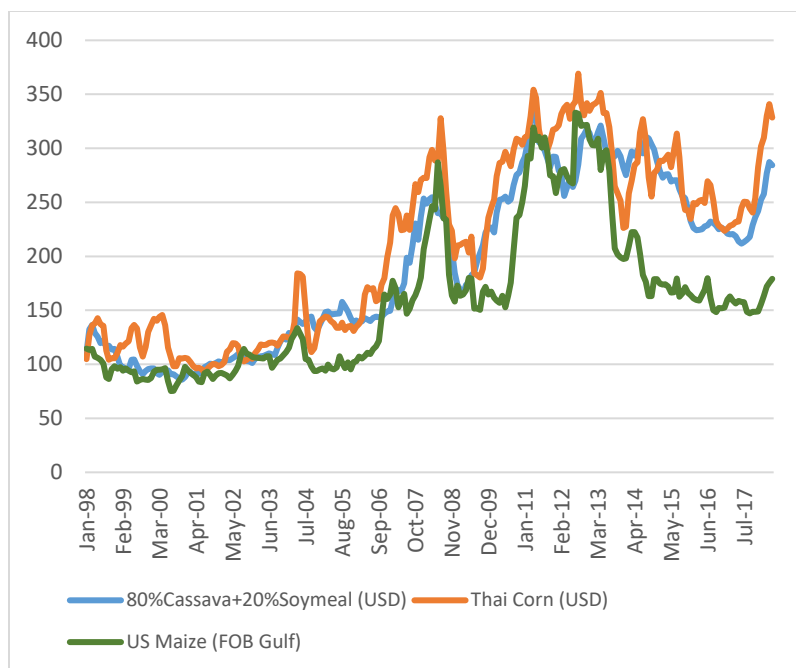


**Fig 10** – Myanmar starch prices have not followed the regional trend. The market currently has limited ability to supply the global market and take advantage of the supply shortage.



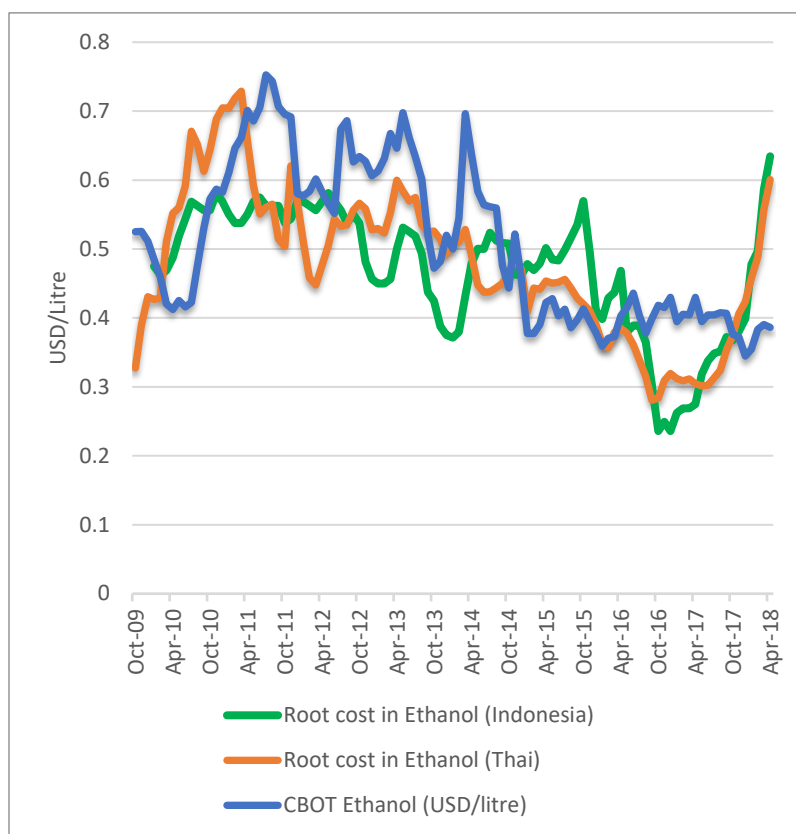
During 2013-2016 Chinese maize market support was influencing cassava price and tapioca starch became relatively expensive compared to maize starch. For applications where the functional properties were less important this created pressure on deep processors producing products such as glucose or sorbitol and then having to compete against corn-based products on the world market. After a short period of relatively comparable prices, cassava starch is once again trading at a significant premium and deep processors evaluate options to remain competitive.

**Fig 11** – Tapioca versus US corn starch.



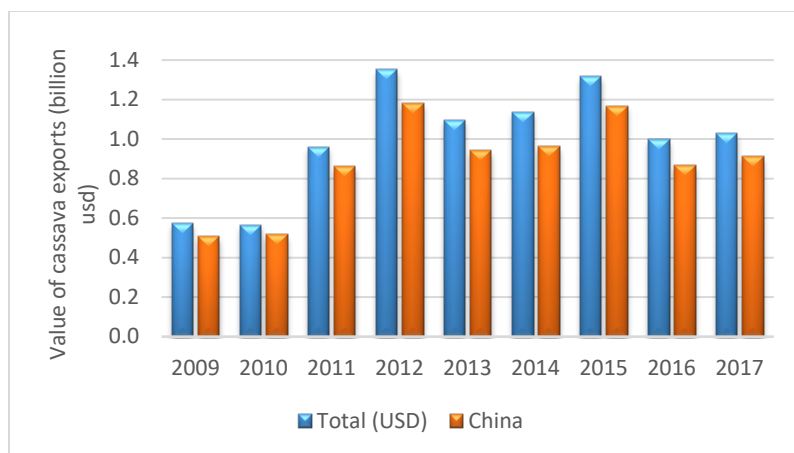
**Fig 12** – Thai feed prices.

The Thai corn price remains significantly higher than the world price as various policies seek to protect incomes of domestic producers. The domestic cassava chip price follows the domestic corn price closely with a cassava-soymeal substitute (80:20) currently cheaper than domestic maize in feed rations.

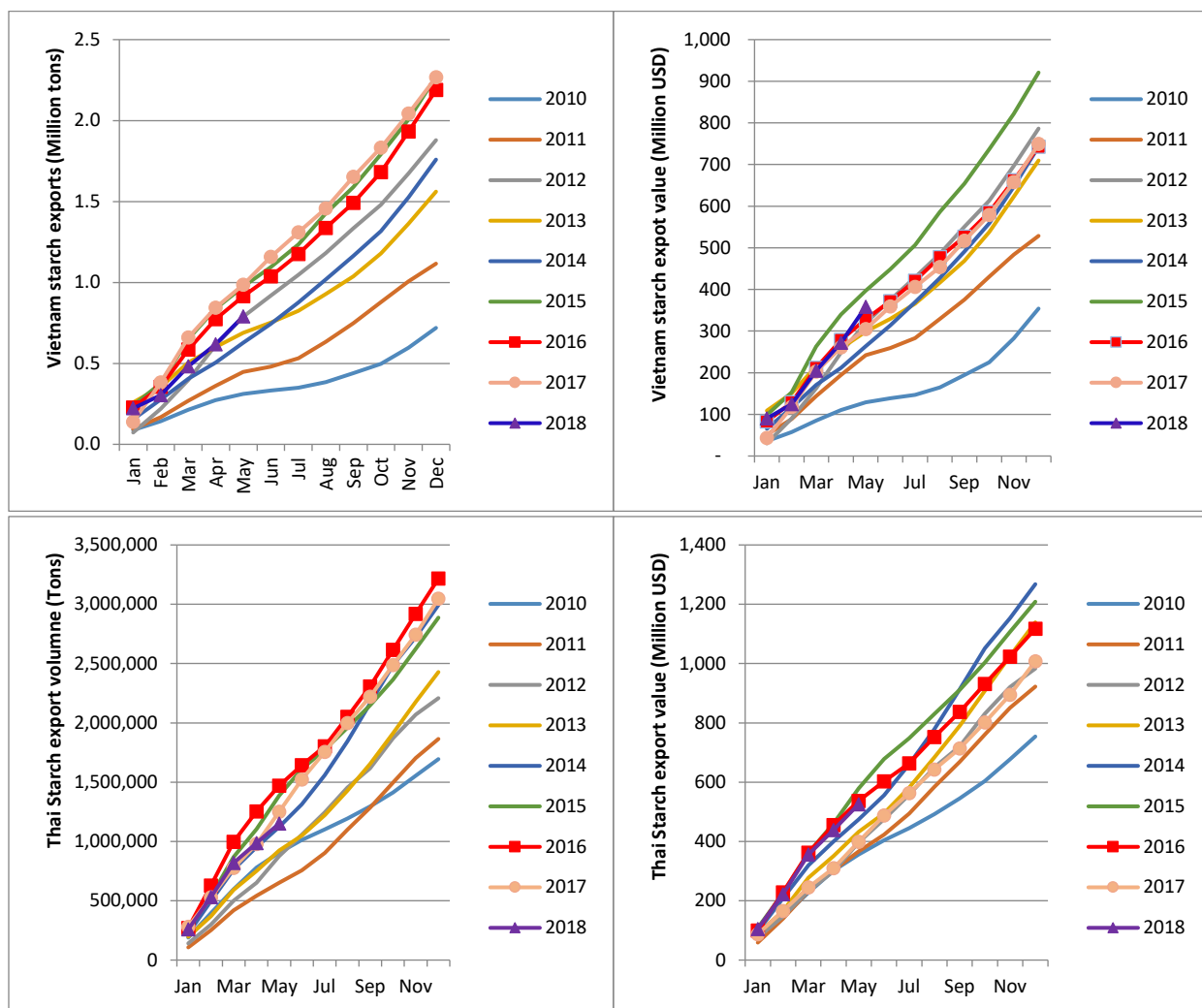


**Fig 13** – Cassava root price and ethanol.

The high costs of cassava roots and low oil prices put pressure on biofuel manufacturers using cassava as a feed stock. This figure shows the cost of cassava roots used to produce a litre of ethanol (using a conversion of 1ton=160Litres) relative to the price of Ethanol (Nearby Futures CBOT). Many biofuel factories in Vietnam closed due to this problem. The reduction in the price of cassava roots made biofuel production more viable for a few months, but the resurgent cassava price will again put pressure on biofuel producers and the ability for governments to achieve mandates.

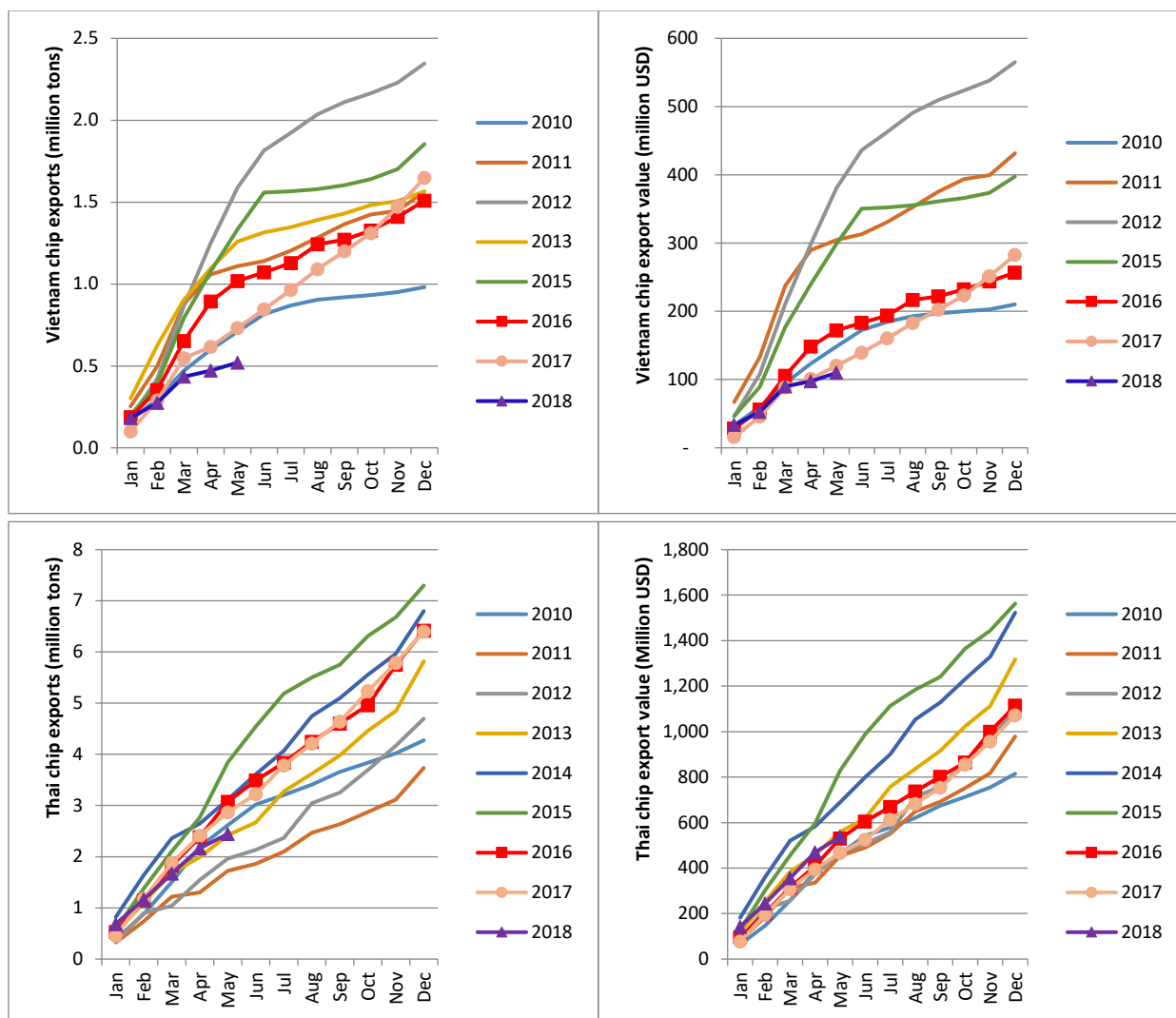


**Fig 14** – Value of Vietnam cassava exports and value of exports to China. The Vietnam industry is heavily reliant on the Chinese market for both starch and dried cassava chips



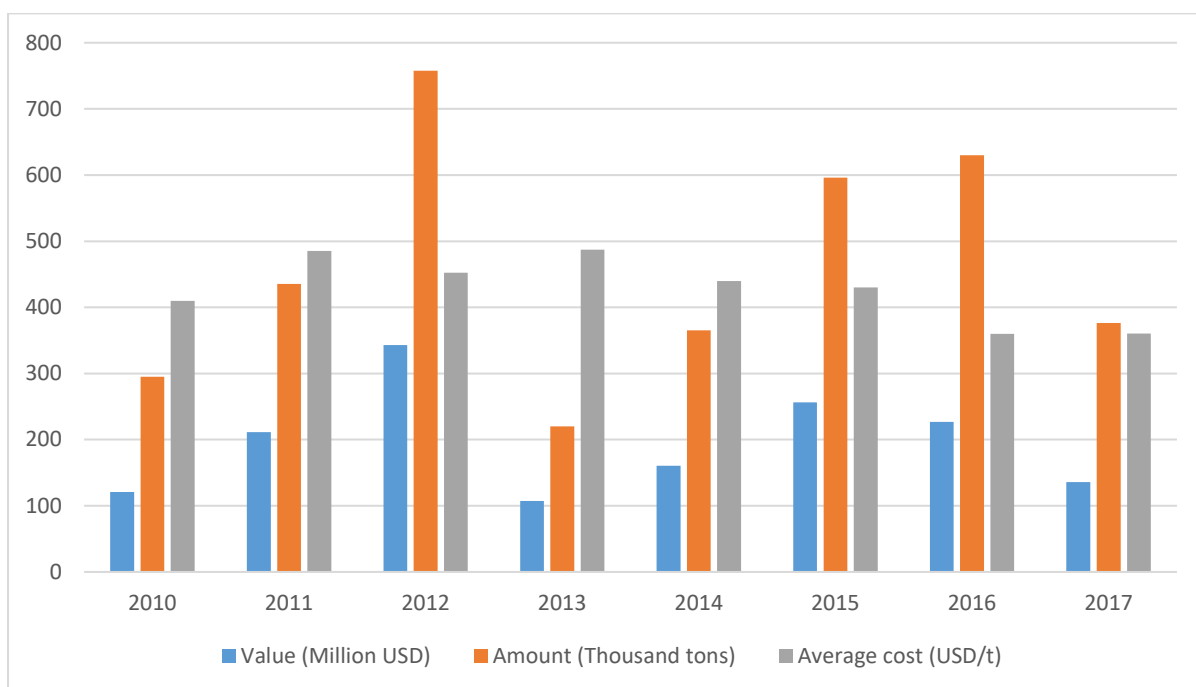
**Fig 15** – Monthly cumulative volume and value of cassava starch exports from Vietnam and Thailand. Despite falling prices, Vietnam cassava exports remained at all-time high levels in 2017. Export volumes for Thailand and Vietnam are down to date in 2018 as supply contracted.



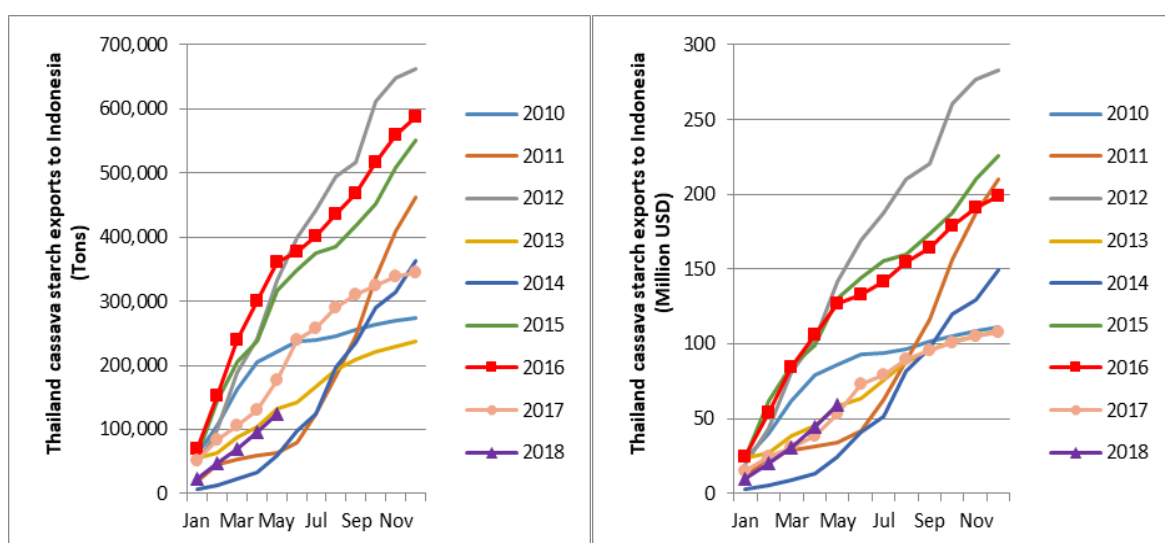


**Fig 16** – Monthly cumulative volume and value of cassava chip exports from Vietnam and Thailand. There has been a major decline in the quantity and value of cassava chips exported from Vietnam. Thai cassava chips are almost exclusively exported to China whereas Vietnam exports a small proportion to other East Asian countries.

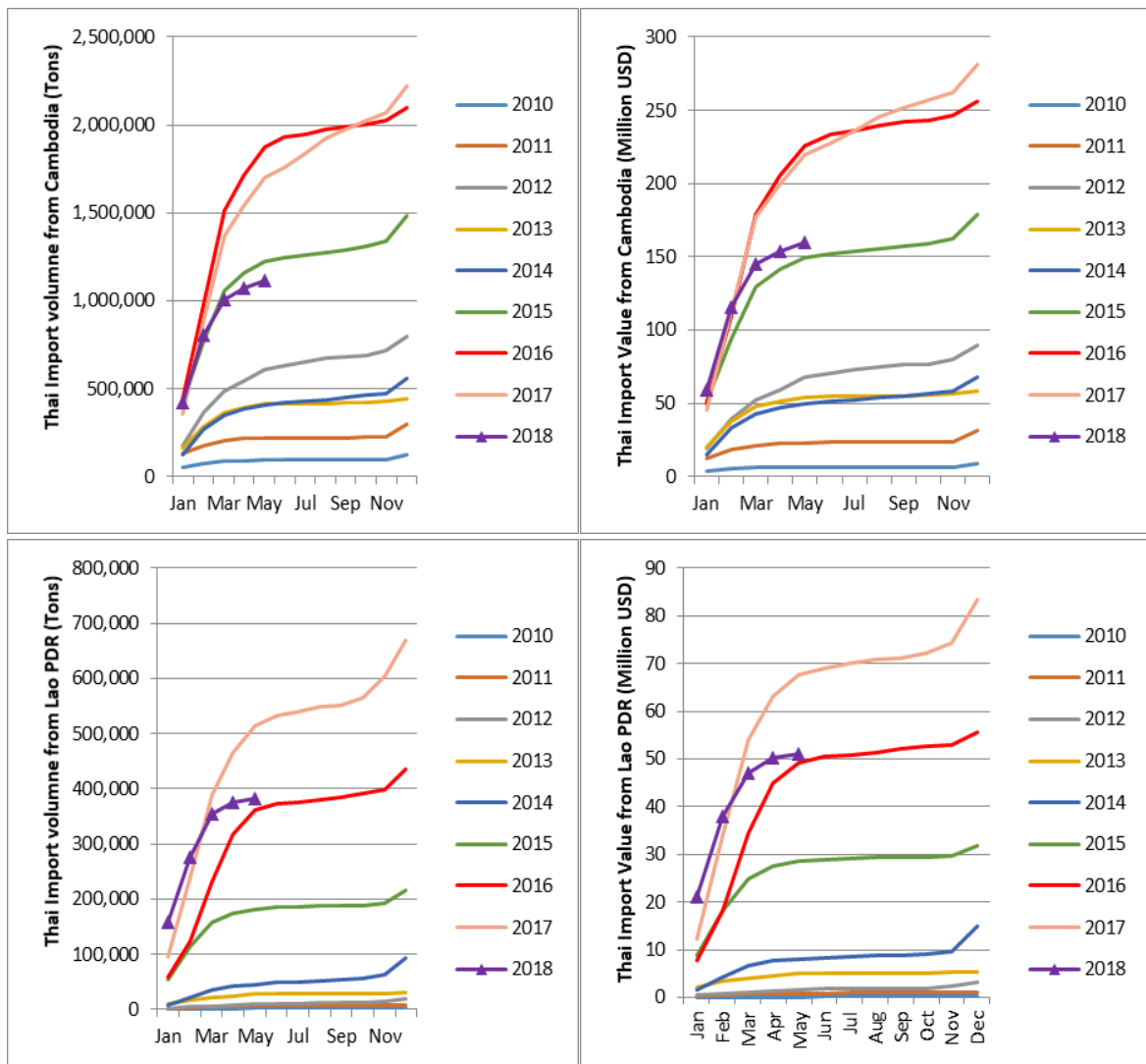




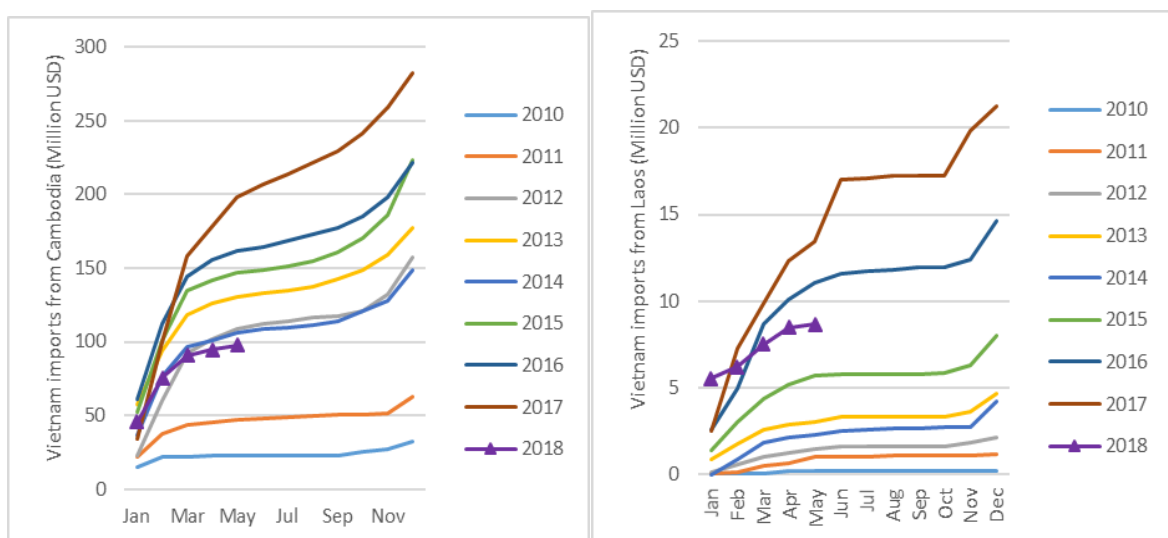
**Fig 17** – Global volume and value of Indonesian cassava starch imports. Despite being one of the world’s largest cassava producing countries, Indonesia remained the second largest importer of cassava starch in 2016.



**Fig 18** – Monthly cumulative exports of cassava starch from Thailand to Indonesia. Despite Thai cassava starch becoming relatively cheaper than domestic Indonesian cassava starch imports have remained relatively weak. This is due to cassava starch becoming more expensive than corn-based substitutes. Sweetener manufacturers have become increasingly uncompetitive against corn syrups from the US, China and India.



**Fig 19 – Monthly cumulative Thai import volume and value of cassava (fresh or dried) from Cambodia and Lao PDR**



**Fig 20 – Monthly cumulative Vietnam import volume and value of cassava (fresh or dried) from Cambodia and Lao PDR**

# PRODUCTION STATISTICS

## INDONESIA

Province	Area (ha)		Production (tons)		Yield (t/ha)	
	2014	2015	2014	2015	2014	2015
ACEH	2,432	2,226	31,621	29,131	13.00	13.09
SUMATERA UTARA	42,062	47,837	1,383,346	1,619,495	32.89	33.85
SUMATERA BARAT	5,644	5,318	217,962	208,386	38.62	39.19
RIAU	4,038	3,578	117,287	103,599	29.05	28.95
JAMBI	2,268	2,018	35,550	43,433	15.67	21.52
SUMATERA SELATAN	10,930	8,801	220,014	217,807	20.13	24.75
BENGKULU	4,496	3,573	78,853	80,309	17.54	22.48
LAMPUNG	304,468	279,337	8,034,016	7,387,084	26.39	26.45
KEP. BANGKA BELITUNG	1,064	1,423	19,759	35,024	18.57	24.61
KEP. RIAU	723	708	8,979	9,157	12.42	12.93
DKI JAKARTA	0	0	0	0		
JAWA BARAT	93,921	85,288	2,250,024	2,000,224	23.96	23.45
JAWA TENGAH	153,201	150,874	3,977,810	3,571,594	25.96	23.67
DI YOGYAKARTA	56,120	55,626	884,931	873,362	15.77	15.70
JAWA TIMUR	157,111	146,787	3,635,454	3,161,573	23.14	21.54
BANTEN	5,679	4,176	85,943	74,163	15.13	17.76
BALI	8,006	8,009	131,887	86,070	16.47	10.75
NUSA TENGGARA BARAT	4,706	5,030	92,643	107,254	19.69	21.32

NUSA TENGGARA TIMUR	63,836	60,557	677,577	637,315	10.61	10.52
KALIMANTAN BARAT	12,034	10,609	192,967	173,449	16.04	16.35
KALIMANTAN TENGAH	3,608	3,031	43,342	45,712	12.01	15.08
KALIMANTAN SELATAN	4,817	3,478	92,272	71,751	19.16	20.63
KALIMANTAN TIMUR	2,988	2,384	60,941	53,966	20.40	22.64
KALIMANTAN UTARA	2,006	1,729	41,947	38,936	20.91	22.52
SULAWESI UTARA	3,685	3,594	46,553	44,123	12.63	12.28
SULAWESI TENGAH	4,074	2,231	84,688	47,295	20.79	21.20
SULAWESI SELATAN	22,083	26,783	478,486	565,958	21.67	21.13
SULAWESI TENGGARA	8,420	8,398	175,086	175,095	20.79	20.85
GORONTALO	302	197	3,987	2,653	13.20	13.47
SULAWESI BARAT	1,420	1,109	29,902	24,984	21.06	22.53
MALUKU	5,013	4,842	97,959	134,661	19.54	27.81
MALUKU UTARA	7,618	5,556	147,917	120,283	19.42	21.65
PAPUA BARAT	992	987	11,169	11,181	11.26	11.33
PAPUA	3,729	3,822	45,512	46,388	12.20	12.14
INDONESIA	1,003,494	949,916	#####	21,801,415	23.35	22.95

## VIETNAM

	Area (thousand ha)		Production (thousand tons)		Yield (t/ha)	
	2015	Sơ bộ 2016	2015	Prel. 2016	2015	Prel. 2016
<b>Total Vietnam</b>	567.9	569.9	10739.9	10931.8	18.91	19.18
Hà Nội	1.8	1.6	34.9	31.8	19.39	19.88
Hà Giang	4.6	5	36.3	39.8	7.89	7.96
Cao Bằng	4	3.5	59.9	52.2	14.98	14.91
Bắc Kạn	3	2.4	32.1	25.7	10.70	10.71
Tuyên Quang	4.6	4.4	59.8	57.3	13.00	13.02
Lào Cai	8.9	8.8	114.5	113.9	12.87	12.94
Yên Bái	15.8	14.8	305.8	288.5	19.35	19.49
Thái Nguyên	3.4	3.4	50.1	49.3	14.74	14.50
Lạng Sơn	4.5	3.9	45.2	39.3	10.04	10.08
Bắc Giang	5	4.3	71.7	64	14.34	14.88
Phú Thọ	8.3	8.3	115.1	115.2	13.87	13.88
Điện Biên	7.7	7.4	61.7	60	8.01	8.11
Lai Châu	4.4	4.4	36.9	38.7	8.39	8.80
Sơn La	31.2	32.8	359.5	386.5	11.52	11.78
Hoà Bình	11.7	11.2	149.6	144.5	12.79	12.90
Thanh Hoá	17.8	18	261.9	269.5	14.71	14.97
Nghệ An	17.4	19.3	384.8	436.6	22.11	22.62
Hà Tĩnh	4.1	3.1	65.3	42.9	15.93	13.84
Quảng Bình	6.3	6.9	114.6	129.1	18.19	18.71
Quảng Trị	12.7	13	208.8	218.4	16.44	16.80
Thừa Thiên Huế	7.1	7.1	131.3	132.1	18.49	18.61
Quảng Nam	12.8	12.6	229.2	233.1	17.91	18.50
Quảng Ngãi	19.8	19.9	377.9	379.2	19.09	19.06
Bình Định	13.6	12.8	334	323.7	24.56	25.29

Phú Yên	23	25.2	414.1	498.7	18.00	19.79
Khánh Hoà	5.8	5.4	107.8	89.8	18.59	16.63
Bình Thuận	30.9	31.2	521.4	494.3	16.87	15.84
Kon Tum	39.5	39.3	592	590	14.99	15.01
Gia Lai	63.7	64.8	1180.9	1207.1	18.54	18.63
Đắk Lắk	35.2	35.9	720.7	729.5	20.47	20.32
Đắk Nông	18.4	15.4	291.2	244.6	15.83	15.88
Bình Phước	17.7	17	413.8	397	23.38	23.35
Tây Ninh	57.6	61.6	1868.3	2024	32.44	32.86
Bình Dương	4.8	4.8	87	88.9	18.13	18.52
Đồng Nai	15.8	15.7	399.2	399.7	25.27	25.46
Bà Rịa - Vũng Tàu	8.6	8.7	218.7	214.4	25.43	24.64
Long An	1.2	1.2	17.9	20.4	14.92	17.00
Vĩnh Long	0.2	0.2	3	2.9	15.00	14.50
An Giang	0.7	1.7	15.4	47.1	22.00	27.71
Kiên Giang	0.9	0.7	25.8	20.5	28.67	29.29



## CAMBODIA

	Cultivated Area (ha)		Production(t)		Yield (t/ha)	
Province	2016- 17	2017- 18	2016-17	2017-18	2016- 17	2017- 18
Banteay Mean Chey	85,251	109,627	1,752,584	2,192,884	20.6	20.0
Battambang	134,385	78,488	3,769,266	2,330,021	28.0	29.7
Kampong Cham	23,072	22,243	336,430	474,312	14.6	21.3
Kampong Chhnang	374	331	2,122	1,908	5.7	5.8
Kampong Speu	89	115	2,625	2,037	29.5	17.7
Kampong Thom	54,039	48,246	1,176,919	1,055,773	21.8	21.9
Kampot	739	857	3,000	13,055	4.1	15.2
Kandal	-	-	-	-	-	-
Koh Kong	106	93	1,667	1,456	15.7	15.7
Kratie	66,102	71,692	1,420,387	1,373,678	21.5	19.2
Mondulkiri	11,275	11,024	202,950	**	18.0	**
Phnom Penh City	5	8	13	150	2.6	18.8
Preah Vihear	20,175	20,922	229,062	230,142	11.4	11.0
Prey Veng	947	-	14,205	-	15.0	-
Pursat	22,924	26,185	458,480	523,700	20.0	20.0
Ratanakiri	17,263	15,563	290,842	258,733	16.8	16.6
Siem Reap	17,985	20,030	287,907	320,480	16.0	16.0
Preah Sihanouk	25	14	380	108	15.2	7.7
Stueng Treng	13,428	13,827	268,560	270,041	20.0	19.5

Svay Rieng	9,129	6,724	145,232	118,503	15.9	17.6
Takeo	1,698	1,836	25,470	26,850	15.0	14.6
Otdar Mean Chey	60,132	58,280	1,151,240	1,211,030	19.1	20.8
Kep	12	16	161	199	13.4	12.4
Pailin	59,087	54,336	1,477,175	1,358,400	25.0	25.0
Tbaung Khmom	53,620	53,455	1,158,820	1,042,360	21.6	19.5
<b>Total</b>	651,862	613,912	14,175,497	12,805,820	21.7	20.9

\*\* Error in report

## LAO PDR

Province	Planted Area: (ha)			Yield: (ton/ha)			Production: (ton)		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
<b>Northern Region</b>	<b>14,430</b>	<b>19,695</b>	<b>20,700</b>	<b>26.81</b>	<b>30.38</b>	<b>30.93</b>	<b>386,805</b>	<b>598,263</b>	<b>640,300</b>
Phongsaly	655	825	670	7.30	12.93	6.99	4,780	10,665	4,680
Luangnamtha	1,120	1,595	1,595	27.41	29.73	29.73	30,700	47,420	47,420
Oudomxay	450	-	-	16.84	-	-	7,580	-	-
Bokeo	-	-	-	-	-	-	-	-	-
Luangprabang	2,970	3,840	2,215	19.01	21.46	23.00	56,445	82,420	50,940
Huaphanh	1,780	1,950	1,100	14.93	18.79	13.03	26,575	36,643	14,330
Xayabury	7,455	11,485	15,120	34.97	36.67	34.59	260,725	421,115	522,930
<b>Central Region</b>	<b>22,575</b>	<b>25,980</b>	<b>26,505</b>	<b>25.74</b>	<b>27.18</b>	<b>26.96</b>	<b>581,150</b>	<b>706,155</b>	<b>714,675</b>
Vientiane.C	1,785	2,120	1,140	39.30	41.30	27.39	70,155	87,555	31,230
Xiengkhuang	1,100	1,315	1,135	12.63	15.91	21.92	13,890	20,920	24,875
Vientiane	3,040	5,250	5,250	22.44	22.62	21.54	68,210	118,770	113,070
Borikhamxay	10,865	11,020	12,960	30.27	32.68	31.69	328,900	360,180	410,765
Khammuane	1,240	1,780	1,780	35.44	27.04	23.88	43,945	48,130	42,510
Savannakhet	3,120	3,070	2,815	10.79	14.98	24.02	33,650	46,000	67,625
Xaysomboun	1,425	1,425	1,425	15.72	17.26	17.26	22,400	24,600	24,600
<b>Southern Region</b>	<b>23,470</b>	<b>29,790</b>	<b>28,605</b>	<b>28.20</b>	<b>36.19</b>	<b>36.88</b>	<b>661,850</b>	<b>1,078,060</b>	<b>1,055,025</b>
Saravan	19,310	20,100	18,060	23.60	28.43	28.89	455,795	571,490	521,765
Sekong	1,090	1,190	1,180	20.37	21.61	26.09	22,200	25,710	30,790
Champasack	2,380	7,670	7,670	70.00	60.00	60.00	166,600	460,200	460,200
Attapeu	690	830	1,695	25.01	24.89	24.94	17,255	20,660	42,270
<b>Total</b>	<b>60,475</b>	<b>75,465</b>	<b>75,810</b>	<b>26.95</b>	<b>31.57</b>	<b>31.79</b>	<b>1,629,805</b>	<b>2,382,478</b>	<b>2,410,000</b>

## MYANMAR

Region/State	Harvested area (ha)	Production (tons)	Average yield (t/ha)
Ayeyarwady	12,723	189,054	14.86
Bago	82	2,039	24.87
Chin	91	381	4.19
Kachin	18,620	186,481	10.02
Kayah	-	-	-
Kayin	931	11,660	12.77
Magway	-	-	-
Mandalay	41	457	11.44
Mon	277	3,977	14.36
Rakhine	313	1,953	6.24
Sagaing	1888	13,982	7.41
Shan	296	2,276	7.69
Thanintharyi	716	9,157	12.79
Yangon	647	11,961	18.49
Total	36,625	433,378	11.83

## THAILAND

ProvinceThai	ProvinceEnglish	Plant2016	Harvest2016	Production2016	Yield2016
เชียงใหม่	Chiang Rai	11,098	10,925	213,643	19.56
พะเยา	Phayao	2,199	2,181	44,661	20.48
ลำปาง	Lampang	5,677	5,436	106,649	19.62
ลำพูน	Lamphun	598	576	10,167	17.64
เชียงใหม่	Chiang Mai	367	361	6,994	19.35
ตาก	Tak	23,824	23,749	498,004	20.97
กำแพงเพชร	Kamphaeng Phet	112,196	104,776	2,337,078	22.31
สุโขทัย	Sukhothai	15,396	12,995	225,001	17.31
แพร่	Phrae	3,805	3,719	69,649	18.73
น่าน	Nan	294	294	5,584	18.98
อุดรดิตถ์	Uttaradit	4,880	4,708	92,720	19.69
พิษณุโลก	Phitsanulok	30,120	25,452	491,566	19.31
พิจิตร	Phichit	3,915	3,705	73,852	19.93
นครสวรรค์	Nakhon Sawan	62,726	58,952	1,244,435	21.11
อุทัยธานี	Uthai Thani	25,094	23,928	502,616	21.01
เพชรบูรณ์	Phetchabun	33,723	32,740	739,711	22.59
เลย	Loei	56,756	55,890	1,145,494	20.49
หนองบัวลำภู	Nong Bua Lamphu	10,466	10,210	228,279	22.36
อุดรธานี	Udon Thani	49,888	49,160	1,130,567	23.00
หนองคาย	Nong Khai	2,645	2,576	50,771	19.71
บึงกาฬ	Bung Kan	2,143	2,100	37,433	17.83
สกลนคร	Sakon Nakhon	20,922	20,390	402,202	19.73

นครพนม	Nakhon Phanom	5,837	5,837	117,388	20.11
มุกดาหาร	Mukdahan	22,769	22,769	490,998	21.56
ยโสธร	Yasothon	14,472	14,131	313,660	22.19
อำนาจเจริญ	Amnat Charoen	10,714	10,312	219,535	21.29
อุบลราชธานี	Ubon Ratchathani	72,485	70,633	1,493,664	21.15
ศรีสะเกษ	Si Sa Ket	25,268	24,525	525,544	21.43
สุรินทร์	Surin	16,498	16,467	379,513	23.05
บุรีรัมย์	Buri Ram	38,197	38,192	937,810	24.56
มหาสารคาม	Maha Sarakham	17,728	17,715	359,681	20.31
ร้อยเอ็ด	Roi Et	8,354	8,343	168,904	20.24
กาฬสินธุ์	Kalasin	40,349	40,345	880,668	21.83
ขอนแก่น	Khon Kaen	33,031	33,010	683,735	20.71
ชัยภูมิ	Chaiyaphum	86,566	86,525	1,818,426	21.02
นครราชสีมา	Nakhon Ratchasima	243,762	243,665	5,572,432	22.87
สระบุรี	Saraburi	6,915	6,752	130,894	19.39
ลพบุรี	Lop Buri	46,847	43,534	927,304	21.30
ชัยนาท	Chai Nat	12,411	12,025	229,337	19.08
สุพรรณบุรี	Suphan Buri	6,488	6,335	128,760	20.33
ปราจีนบุรี	Prachin Buri	23,859	23,105	465,796	20.16
ฉะเชิงเทรา	Chachoengsao	43,695	43,374	884,091	20.38
สระแก้ว	Sa Kaeo	71,797	69,103	1,378,555	19.95
จันทบุรี	Chanthaburi	25,732	24,929	482,355	19.35
ระยอง	Rayong	6,600	6,310	171,891	27.24

ชลบุรี	Chon Buri	<b>40,676</b>	<b>39,265</b>	982,910	25.03
กาญจนบุรี	Kanchanaburi	<b>77,699</b>	<b>75,827</b>	1,512,391	19.94
ราชบุรี	Ratchaburi	<b>12,672</b>	<b>12,348</b>	242,929	19.68
เพชรบุรี	Phetchaburi	<b>111</b>	<b>111</b>	2,114	18.98
ประจวบคีรีขันธ์	Prachuap Khiri Khan	<b>134</b>	<b>134</b>	2,742	20.43

## PHILIPPINES

	Area (ha)		Production (tons)		Yield (t/ha)	
	2015	2016	2015	2016	2015	2016
<b>PHILIPPINES</b>	222,993	229,769	2,714,346	2,755,146	12.2	12.0
<b>..CAR</b>	659	877	13,377	16,833	20.3	19.2
....Abra	16	16	48	47	3.0	3.0
....Apayao	445	445	12,098	11,432	27.2	25.7
....Benguet	112	111	748	1,075	6.7	9.7
....Ifugao	31	266	140	3,882	4.5	14.6
....Kalinga	38	23	212	272	5.6	11.7
....Mountain Province	17	16	130	125	7.7	7.8
<b>..ILOCOS REGION</b>	1,916	1,930	17,239	17,617	9.0	9.1
....Ilocos Norte	403	406	2,938	3,030	7.3	7.5
....Ilocos Sur	125	122	1,419	1,373	11.3	11.2
....La Union	233	240	2,608	2,879	11.2	12.0
....Pangasinan	1,155	1,162	10,274	10,337	8.9	8.9
<b>..CAGAYAN VALLEY</b>	14,175	19,114	240,105	312,718	16.9	16.4
....Batanes	4	1	27	10	7.0	7.1
....Cagayan	1,310	1,717	12,966	20,644	9.9	12.0
....Isabela	10,859	13,762	190,798	237,987	17.6	17.3
....Nueva Vizcaya	173	239	1,299	2,334	7.5	9.8
....Quirino	1,830	3,394	35,015	51,743	19.1	15.2
<b>..CENTRAL LUZON</b>	1,935	1,926	20,517	20,954	10.6	10.9
....Aurora	370	373	1,938	2,719	5.2	7.3
....Bataan	196	195	2,640	2,593	13.5	13.3



....Bulacan	103	94	1,659	1,855	16.1	19.7
....Nueva Ecija	83	80	534	351	6.4	4.4
....Pampanga	796	796	9,810	9,665	12.3	12.1
....Tarlac	55	56	419	441	7.6	7.9
....Zambales	332	332	3,516	3,330	10.6	10.0
<b>..CALABARZON</b>	7,253	7,231	51,316	50,242	7.1	6.9
....Batangas	885	860	9,318	8,847	10.5	10.3
....Cavite	302	305	900	830	3.0	2.7
....Laguna	154	157	1,918	1,957	12.5	12.5
....Quezon	5,802	5,795	38,200	37,585	6.6	6.5
....Rizal	110	114	980	1,023	8.9	9.0
<b>..MIMAROPA</b>	2,618	2,830	19,722	19,888	7.5	7.0
....Marinduque	82	88	539	582	6.6	6.6
....Occidental Mindoro	578	808	5,437	5,743	9.4	7.1
....Oriental Mindoro	610	622	5,247	5,234	8.6	8.4
....Palawan	1,056	1,056	6,266	6,222	5.9	5.9
....Romblon	292	257	2,233	2,106	7.6	8.2
<b>..BICOL REGION</b>	22,396	22,330	108,629	105,855	4.9	4.7
....Albay	1,710	1,910	15,912	17,000	9.3	8.9
....Camarines Norte	730	730	4,449	4,872	6.1	6.7
....Camarines Sur	16,665	16,657	73,726	69,862	4.4	4.2
....Catanduanes	156	154	432	476	2.8	3.1
....Masbate	1,185	1,185	7,223	7,793	6.1	6.6
....Sorsogon	1,950	1,694	6,887	5,851	3.5	3.5
<b>..WESTERN VISAYAS</b>	6,432	3,179	59,622	30,497	9.3	9.6
....Aklan	633	627	6,849	6,911	10.8	11.0

....Antique	426	436	3,591	3,763	8.4	8.6
....Capiz	627	628	5,373	5,423	8.6	8.6
....Guimaras	73	62	526	430	7.2	6.9
....Iloilo	1,593	1,426	15,609	13,970	9.8	9.8
....Negros Occidental	3,080	..	27,673	..	9.0	..
<b>..CENTRAL VISAYAS</b>	9,400	7,177	114,035	96,355	12.1	13.4
....Bohol	3,813	4,054	63,307	75,771	16.6	18.7
....Cebu	2,420	2,636	20,256	17,449	8.4	6.6
....Negros Oriental	2,680	..	26,983	..	10.1	
....Siquijor	487	487	3,490	3,135	7.2	6.4
<b>..EASTERN VISAYAS</b>	15,803	15,444	84,216	84,854	5.3	5.5
....Biliran	432	450	3,698	3,837	8.6	8.5
....Eastern Samar	2,054	2,074	14,486	14,358	7.1	6.9
....Leyte	4,990	4,620	38,886	40,255	7.8	8.7
....Northern Samar	2,200	2,187	9,242	8,309	4.2	3.8
....Samar (Western Samar)	4,088	4,091	11,955	12,236	2.9	3.0
....Southern Leyte	2,039	2,022	5,949	5,860	2.9	2.9
<b>..ZAMBOANGA PENINSULA</b>	5,986	6,640	81,339	84,014	13.6	12.7
....Zamboanga del Norte	1,060	1,079	9,558	11,196	9.0	10.4
....Zamboanga del Sur	2,746	3,490	37,452	38,277	13.6	11.0
....Zamboanga Sibugay	354	356	4,739	4,565	13.4	12.8
.....Zamboanga City	1,826	1,716	29,590	29,977	16.2	17.5
<b>..NORTHERN MINDANAO</b>	27,904	27,837	728,845	705,334	26.1	25.3
....Bukidnon	18,221	18,151	480,750	466,905	26.4	25.7
....Camiguin	266	221	3,182	2,132	12.0	9.7
....Lanao del Norte	1,227	1,239	24,163	24,850	19.7	20.1

....Misamis Occidental	1,650	1,652	36,695	34,863	22.2	21.1
....Misamis Oriental	6,540	6,574	184,055	176,584	28.1	26.9
<b>..DAVAO REGION</b>	2,399	2,591	18,605	23,229	7.8	9.0
....Davao del Norte	472	499	3,407	4,091	7.2	8.2
....Davao del Sur	663	698	4,912	5,090	7.4	7.3
....Davao Oriental	497	492	3,240	2,904	6.5	5.9
....Compostela Valley	444	576	4,074	8,054	9.2	14.0
.....Davao City	323	326	2,971	3,090	9.2	9.5
<b>..SOCCSKSARGEN</b>	4,128	3,870	114,398	105,021	27.7	27.1
....North Cotabato	870	865	10,023	9,464	11.5	10.9
....Sarangani	105	94	2,007	1,515	19.1	16.2
....South Cotabato	2,988	2,812	100,078	92,392	33.5	32.9
....Sultan Kudarat	165	99	2,290	1,651	13.9	16.7
<b>..CARAGA</b>	2,722	2,789	18,201	24,720	6.7	8.9
....Agusan del Norte	425	400	3,803	3,579	8.9	8.9
....Agusan del Sur	514	520	5,199	7,865	10.1	15.1
....Dinagat Islands	166	105	460	406	2.8	3.9
....Surigao del Norte	269	254	2,071	1,967	7.7	7.7
....Surigao del Sur	1,348	1,510	6,669	10,904	4.9	7.2
<b>..ARMM</b>	97,266	98,253	1,024,180	1,007,822	10.5	10.3
....Basilan	17,479	17,479	254,150	248,248	14.5	14.2
....Lanao del Sur	32,500	32,500	497,681	497,803	15.3	15.3
....Maguindanao	1,000	1,990	4,236	4,235	4.2	2.1
....Sulu	27,350	27,350	168,600	161,001	6.2	5.9
....Tawi-tawi	18,937	18,934	99,513	96,534	5.3	5.1
<b>..NEGROS ISLAND REGION</b>	..	5,750	..	49,193	..	8.6

....Negros Occi	..	3,065	..	27,594	..	9.0
....Negros Or	..	2,685	..	21,600	..	8.0



