General energy outlook: Implications on food production in Thailand

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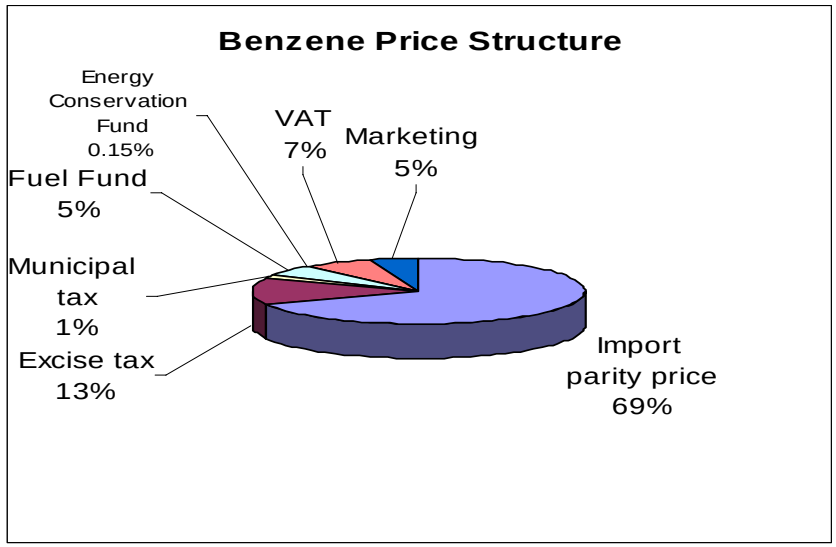
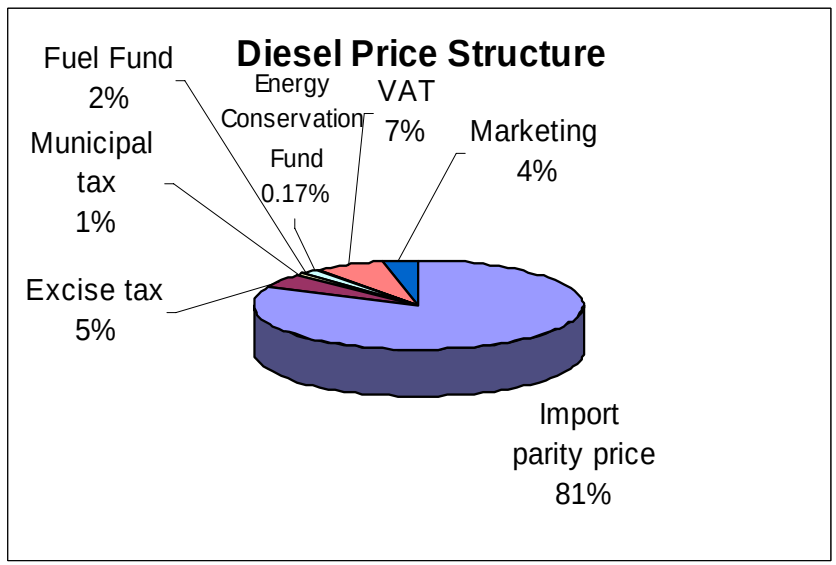
Outline

- Fuel price
- Fuel cost share in production cost of selected food commodities
- Change in GDP
- Change in price
- Fuel consumption
- Government measures
- Bio-fuel in Thailand

Fuel price

- Retail price (THB/liter)
  - Benzene 95 28.74
  - Benzene 91 27.94
  - Diesel 26.09
  - Gasohol 95 27.24
  - Gasohol 91 26.94
  - Diesel Palm 25.59
  - NGV 8.50
  - LPG 16.81

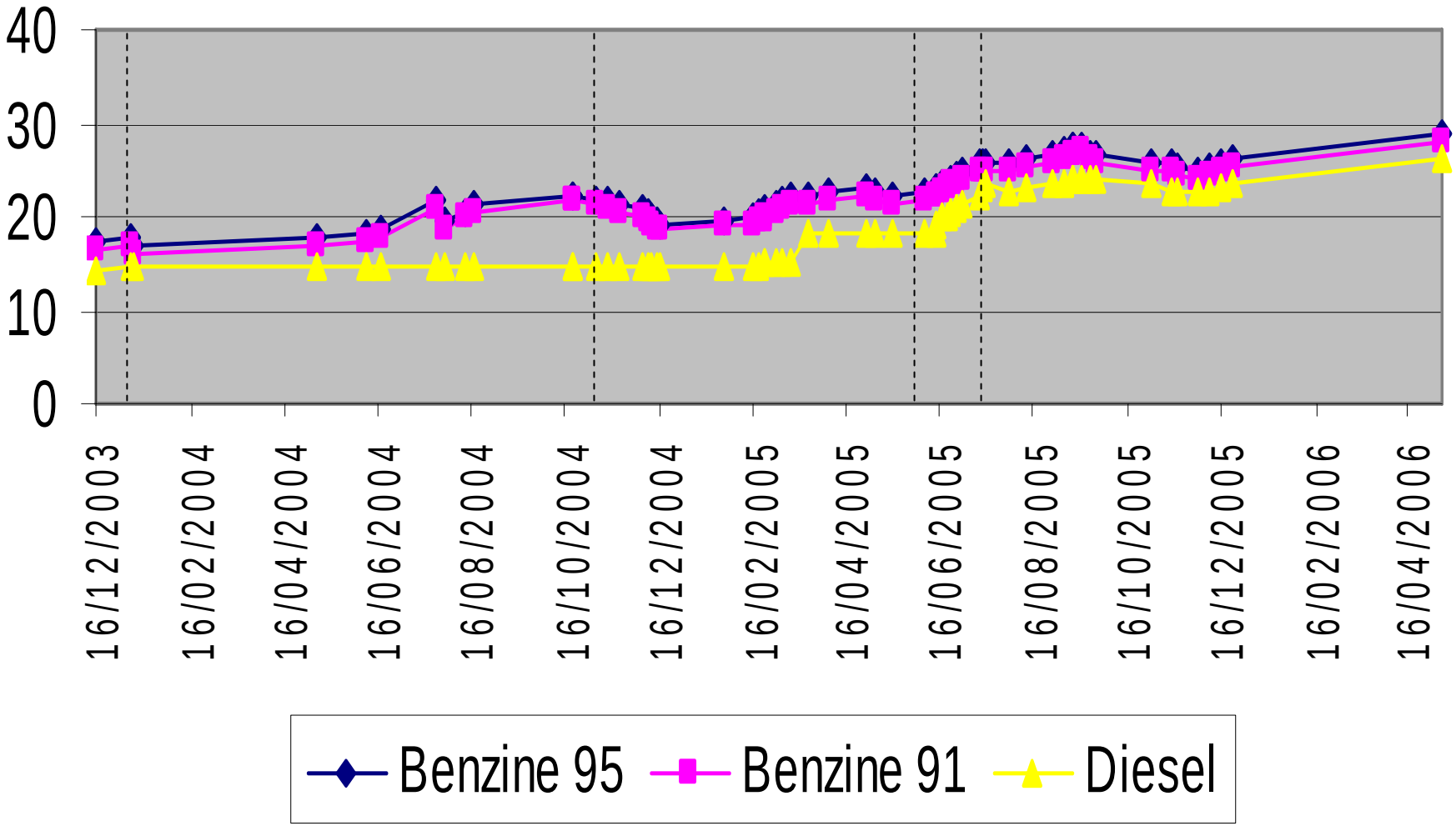




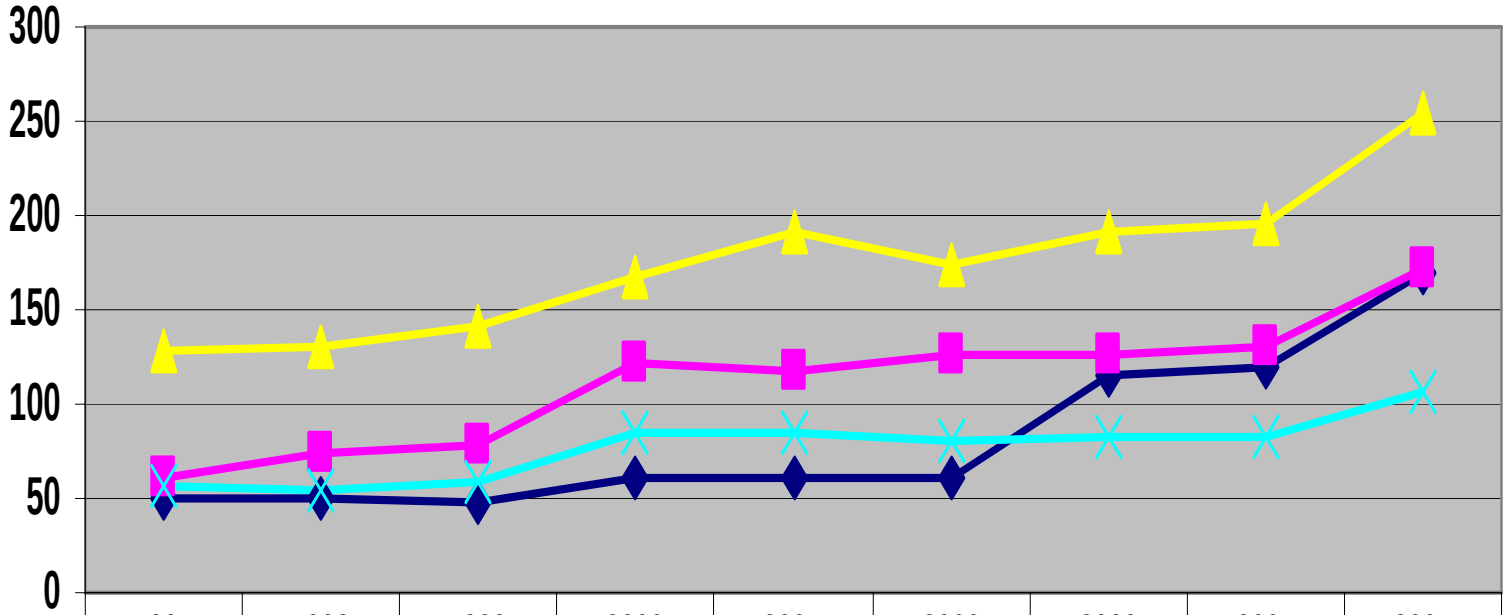
Fuel price (cont.)

- 10/01/2004 controlled price
- 21/10/2004 floated price for benzene 95 and 91, controlled diesel price
- 07/06/2005 semi-float diesel price
- 13/07/2005 fully floated price

Fuel price (THB/liter)

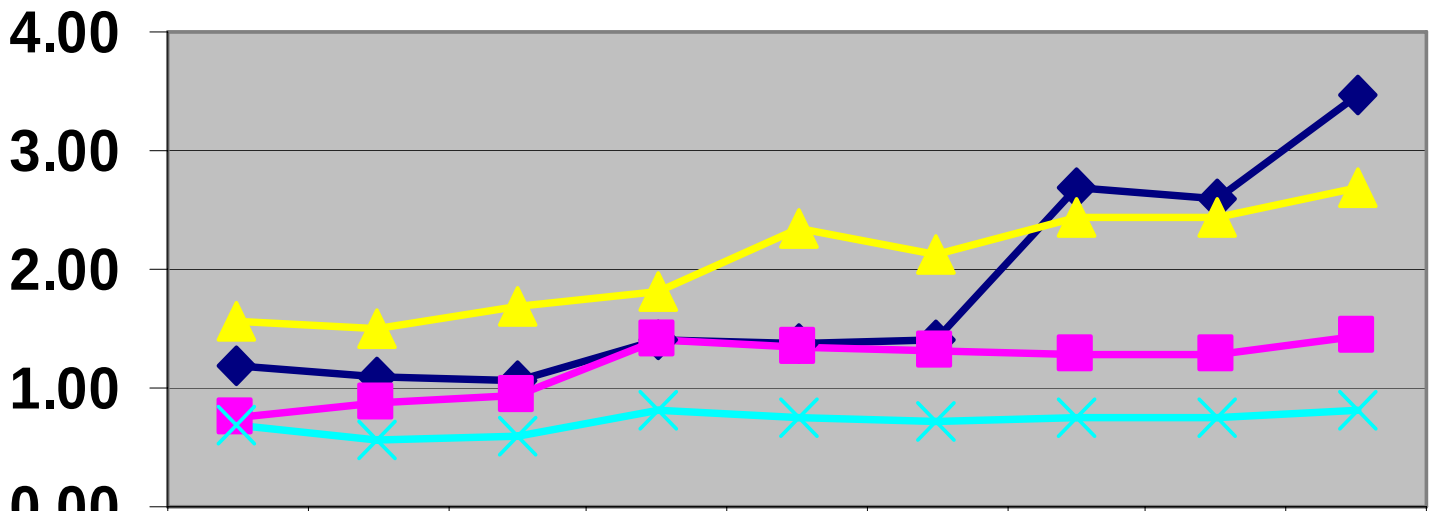


Fuel cost of paddy, mungbean, soybean and peanut production 1997-2005 (THB/ton)



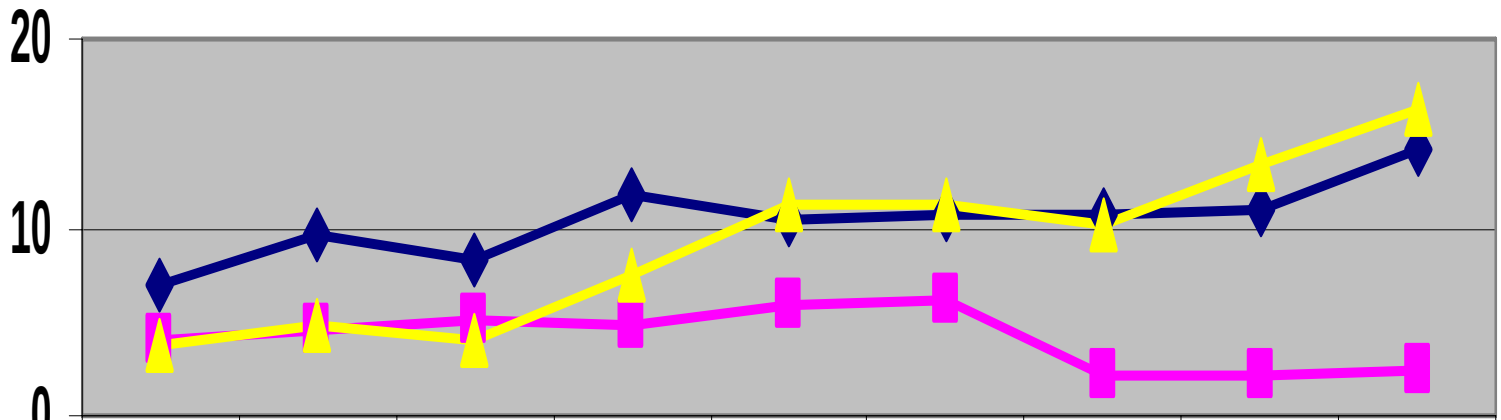
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Paddy	49	50	49	60	60	61	115	120	169
Mungbean	60	73	77	121	117	126	126	131	172
Soybean	128	130	140	167	192	173	191	195	255
Peanut	57	55	60	86	86	80	83	83	107

Fuel cost share of paddy, mungbean, soybean and peanut production 1997-2005 (% of TC)



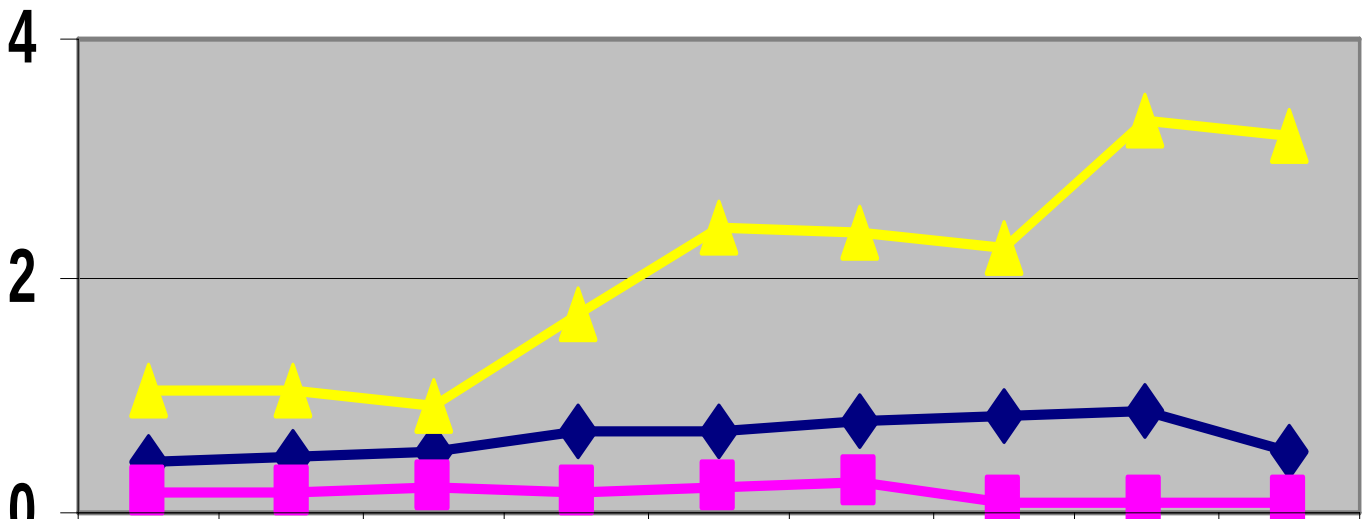
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Paddy	1.19	1.08	1.06	1.41	1.39	1.41	2.68	2.61	3.46
Mungbean	0.74	0.86	0.95	1.41	1.33	1.31	1.27	1.28	1.45
Soybean	1.55	1.50	1.69	1.83	2.34	2.13	2.42	2.45	2.70
Peanut	0.68	0.57	0.60	0.82	0.76	0.71	0.75	0.76	0.82

Fuel cost of oil palm, cassava and sugar cane production,1997-2005 (THB/ton)



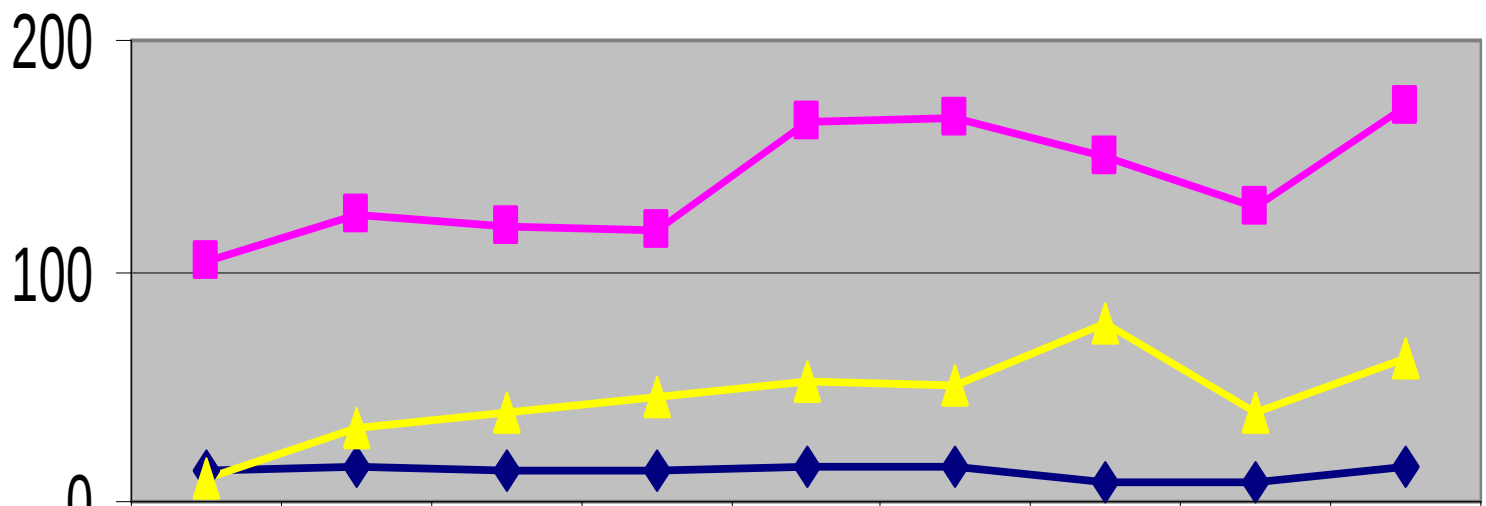
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Oil palm	7	10	8	12	10	11	11	11	14
Cassava	4	5	5	5	6	6	2	2	2
Sugar cane	4	5	4	7	11	11	10	13	16

Fuel cost share of oil palm, cassava and sugar cane production,1997-2005 (% of TC)



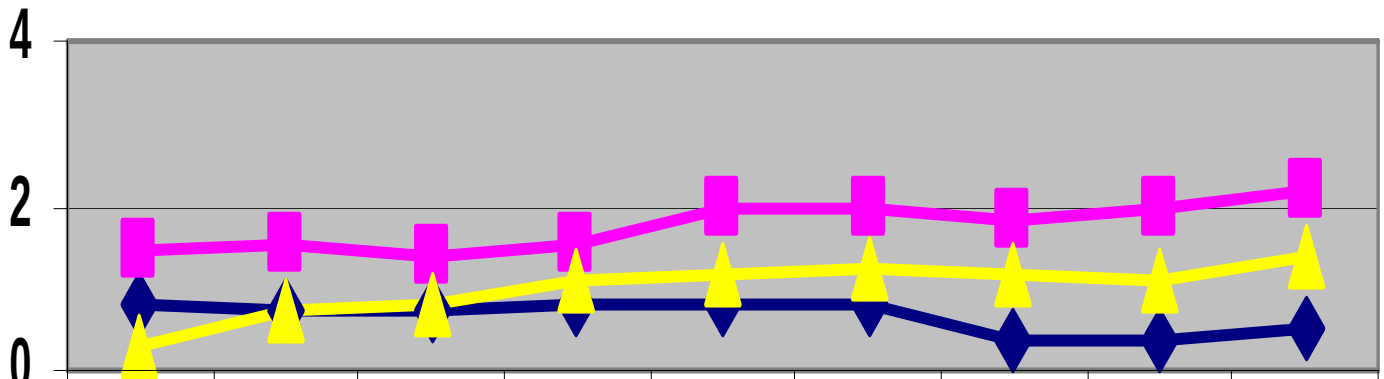
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Oil palm	0.43	0.47	0.50	0.68	0.68	0.79	0.83	0.85	0.52
Cassava	0.16	0.18	0.19	0.19	0.23	0.24	0.09	0.08	0.10
Sugar cane	1.01	1.05	0.89	1.67	2.39	2.36	2.24	3.29	3.16

Fuel cost of pineapple, shallot and onion production, 1997-2005 (THB/ton)



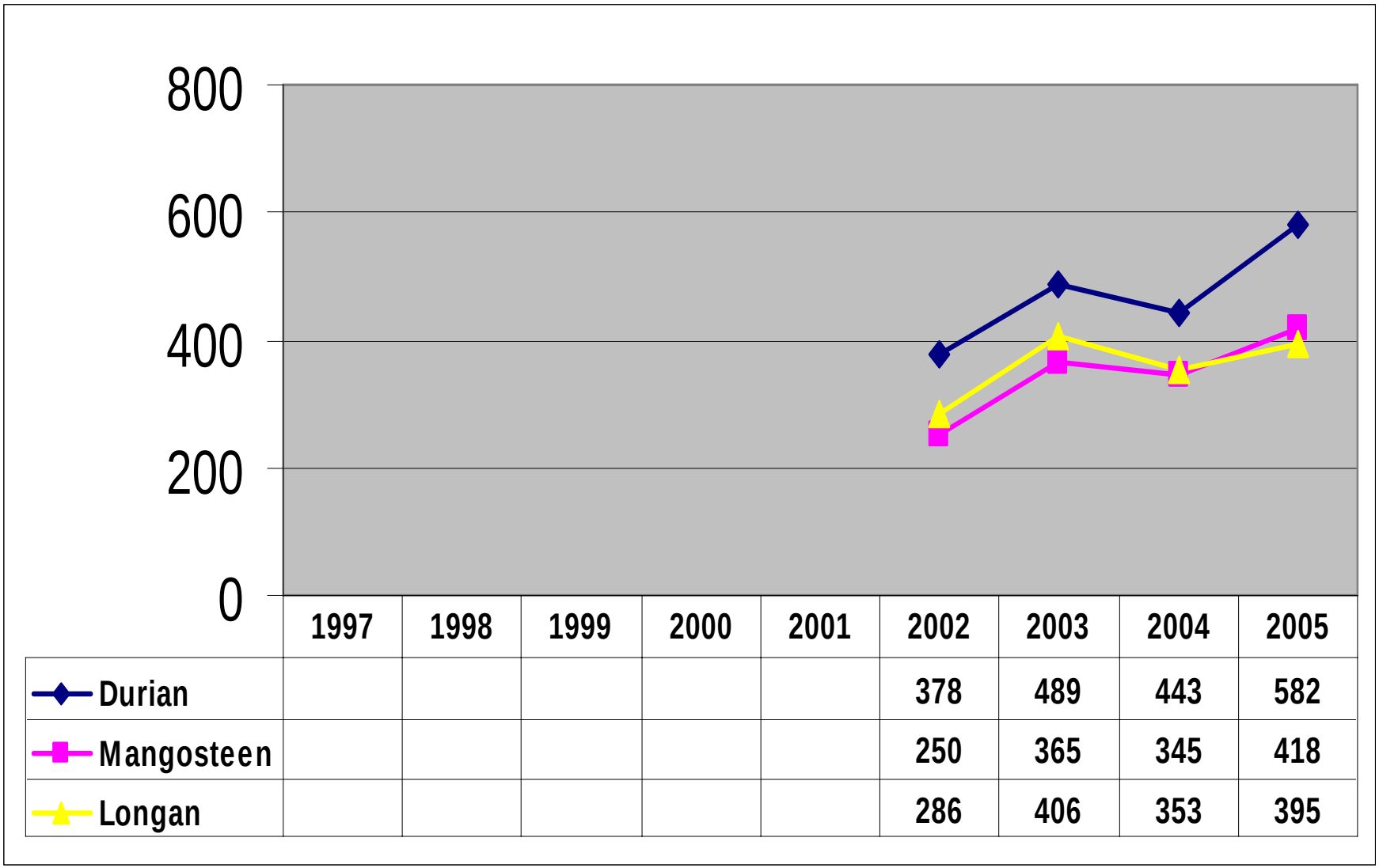
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Pineapple	13	14	13	14	14	15	9	9	15
Shallot	104	124	120	117	164	166	150	128	172
Onion	11	33	38	45	52	50	78	39	62

Fuel cost share of pineapple, shallot and onion production,1997-2005 (% of TC)



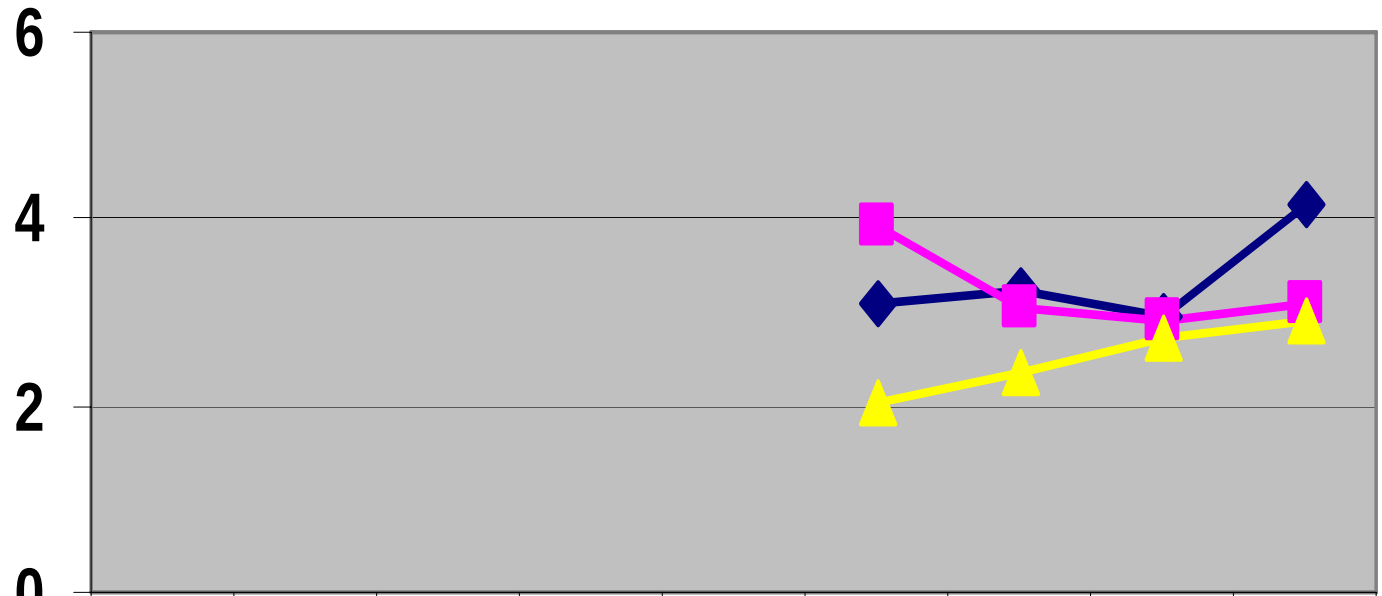
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Pineapple	0.77	0.75	0.73	0.77	0.77	0.77	0.38	0.39	0.52
Shallot	1.49	1.53	1.35	1.55	1.95	1.95	1.83	1.99	2.16
Onion	0.31	0.71	0.77	1.07	1.18	1.21	1.19	1.10	1.35

Fuel cost of durian, mangosteen and longan production,2002-2005 (THB/ton)



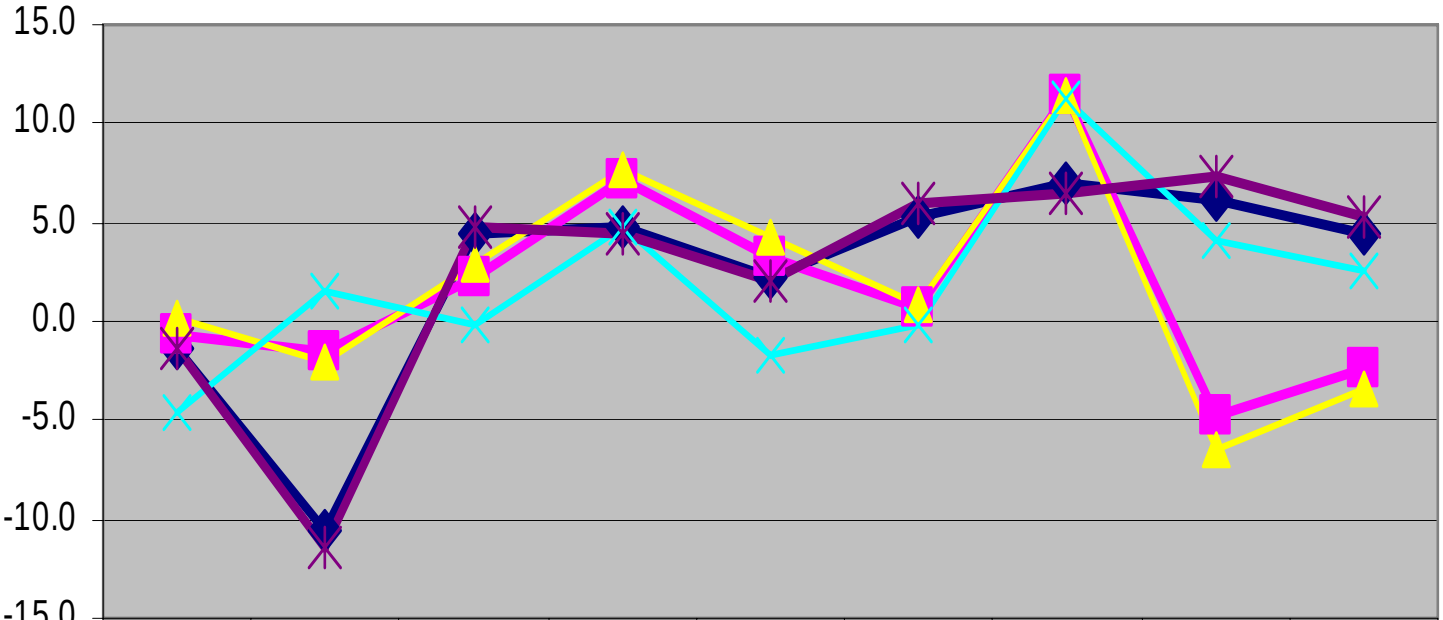
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Durian						378	489	443	582
Mangosteen						250	365	345	418
Longan						286	406	353	395

Fuel cost share of durian, mangosteen and longan production,2002 - 2005 (% of TC)



	1997	1998	1999	2000	2001	2002	2003	2004	2005
Durian						3.11	3.23	2.97	4.14
Mangosteen						3.94	3.04	2.89	3.11
Longan						2.03	2.37	2.73	2.93

Change in GDP



% change

	1997	1998	1999	2000	2001	2002	2003	2004	2005
GDP at 1988 price	-1.4	-10.5	4.4	4.8	2.2	5.3	7.0	6.2	4.5
Agriculture	-0.7	-1.5	2.3	7.2	3.2	0.7	11.4	-4.8	-2.4
Agri., hunting, forestry	0.1	-2.1	2.8	7.7	4.2	0.8	11.5	-6.4	-3.4
Fishing	-4.6	1.5	-0.1	4.8	-1.7	-0.2	11.3	4.0	2.5
Non-agriculture	-1.4	-11.4	4.7	4.5	2.0	5.9	6.5	7.4	5.2

Price index and prices of selected agricultural commodities

			2005			2006		
	2004	2005	Nov	Dec	Jan	Feb	Mar	Average
Farm price index	146.5	173.9	184.1	183.8	186.5	191.1	195.9	191.2
(% change)	(14.8)	(18.7)	(25.2)	(23.0)	(21.8)	(20.8)	(16.8)	(19.7)
Crop price index	154.5	191.7	210.4	209.2	211.5	217.5	227.8	218.9
(% change)	(16.4)	(24.1)	(32.8)	(30.2)	(28.8)	(27.0)	(22.3)	(25.9)
Paddy price (THB/ton)	5,585	6,662	6,692	6,744	6,696	6,497	6,484	6,559
(% change)	(9.4)	(19.3)	(6.2)	(10.1)	(4.3)	(-1.1)	(0.4)	(1.2)
Maize (THB/ton)	4,971	4,874	4,730	4,745	4,822	4,777	4,702	4,767
(% change)	(11.0)	(-1.9)	(7.4)	(-4.1)	(-3.7)	(-3.8)	(-5.4)	(-4.3)
Cassava (THB/ton)	950	1,352	1,267	1,397	1,385	1,365	1,305	1,352
(% change)	(9.1)	(42.3)	(15.4)	(16.5)	(6.2)	(-2.2)	(-11.9)	(-3.0)

% Change in consumer price index

	2005	2006				
	Nov.	Dec.	Jan.	Feb.	Mar.	Compared to Jan.-Mar.05
CPI	**4.5**	**-0.7**	**-0.1**	**0.2**	**0.3**	**1.0**	**5.7**
Food	**5.0**	**-0.6**	**-0.6**	**-0.6**	**0.0**	**2.1**	**4.1**
Non-food	**4.3**	**-0.7**	**0.2**	**0.6**	**0.5**	**0.3**	**6.8**

Fuel consumption

	mill.liters			Change (%)		
	2003	2004	2005	2003	2004	2005
Benzene 91	4,550	4,631	4,320	*4.8*	*1.7*	*(6.4)*
Benzene 95	3,082	2,970	2,336	*3.2*	*(3.6)*	*(21.3)*
Gasohol	3	60	584	*382.3*	*2,214.3*	*873.3*
Diesel	17,550	19,603	19,633	*9.1*	*11.6*	*0.1*

Government measures

- Command and control
- Fuel for fisheries
- Energy conservation
- Consumer prices

Gov’t measures – Command and control

- Close gasoline station during 22:00 – 05:00
- Limitation on light for publicity
- Revise regulation on specific electricity user groups
- Close golf course during 19:00 – 06:00
- Encourage shifting to gasohol
- Target:
  - save fuel 328 mill.liter/yr
  - save electricity 54.9 mill.unit/yr
  - reduce MTBE import by113 mill.liter/yr
  - saving THB 8 bill./yr

Gov’t measures – Fuel for fisheries

- Green gasoline for commercial vessels
  - THB 16.00/liter
  - 12 – 24 nautical miles from shore
  - 5 refineries, 27 sellers, 76 tankers, 31 fishing associations, 9,906 vessels
- Violet gasoline for small scale vessels
  - THB2/liter cheaper
  - Less than 12 nautical miles from shore
  - 14 coastal provinces, 115 gasoline stations
- 65 mill.liter/mth.

Gov’t measures – Energy conservation

- Gasoline substitution
  - NGV, 10% substitution
    - Benzene (2 mill.liters daily) in 2008
    - Diesel (5 mill.liters daily) in 2010
  - Gasohol
    - In place of benzene 95 in 2007
  - Bio diesel
    - Cassava
    - Palm oil
    - molasses

Gov’t measures – Energy conservation (cont.)

- Encourage energy saving
  - 10% decrease on industrial and business sectors in 2009
  - Energy saving in government agencies
    - Gasohol, NGV, electricity saving
  - Public awareness in energy saving

Gov’t measures – Consumer prices

- Target inflation 3.8%, provided that gasoline price not exceeding THB 27/liter
- Control prices for 120 items
- Control retail food prices in food courts, department store, and franchises.
- Increasing punishment for non-compliance
- Mobile unit for monitoring and control
- Increasing participation from buyers in price control

Development of Bio-fuel in Thailand

- 1985 Research on ethanol from sugar cane, oil palm bio-diesel
- 1990 ethanol from molasses
- 1994 gasohol
- 2000 – experiment on FAME (fatty acid methyl ester) with diesel engine
- 2001 Royal project on oil palm bio-diesel
- 2001 – coco diesel for agricultural engine
  – palm diesel
- 2003 – sugar cane, molasses, cassava

Ethanol in Thailand

- 24 plants, capacity 4.8 mill.liter/day
  - In production 5 plants
    - 2 cassava base
    - 4 molasses base
  - To be in production by 2006
    - 4 cassava base
    - 14 from sugar refineries

Ethanol in Thailand (cont.)

	2006	2007	2008
capacity (mill.liter /day)	0.675	1.375	4.685
Raw material requirement (mill.ton/yr.)			
Cassava	0.709	2.197	4.689
Sugar cane	0	3.793	7.590

- Increase yield
  - Sugar cane by 50%
  - Cassava by 60%

Cost of ethanol

Raw material	**THB/liter**
Cassava root	8.94
Shredded cassava	9.41
Cassava starch	13.5
Sugar cane	10.54
Maize	10.65

Implications

- R&D
  - Ethanol from cassava and sugar cane
  - Bio diesel from oil palms+
  - Increasing bio-fuel energy efficiency
- Increasing raw material yields
- Tax and price incentive
- E20+
- Service extension

Thank you