

ARTEMISININ MARKET

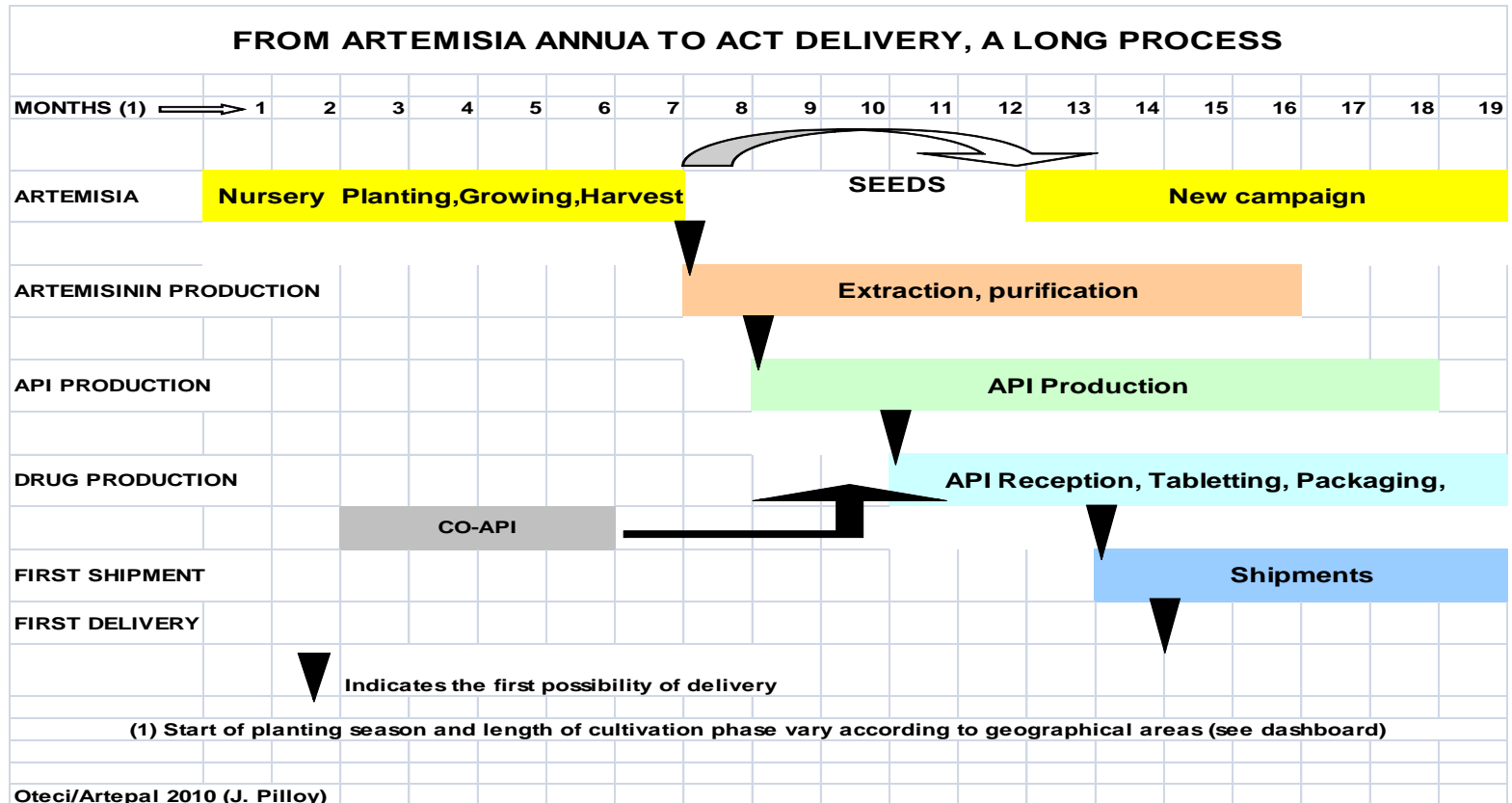
ARTEMISININ CONFERENCE

HANOI, NOVEMBER 2011

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A2S2 - Assured Artemisinin Supply System

Plantations of Year 1 must cover Demand for Year 2



ACT and ARTEMISININ FORECASTS

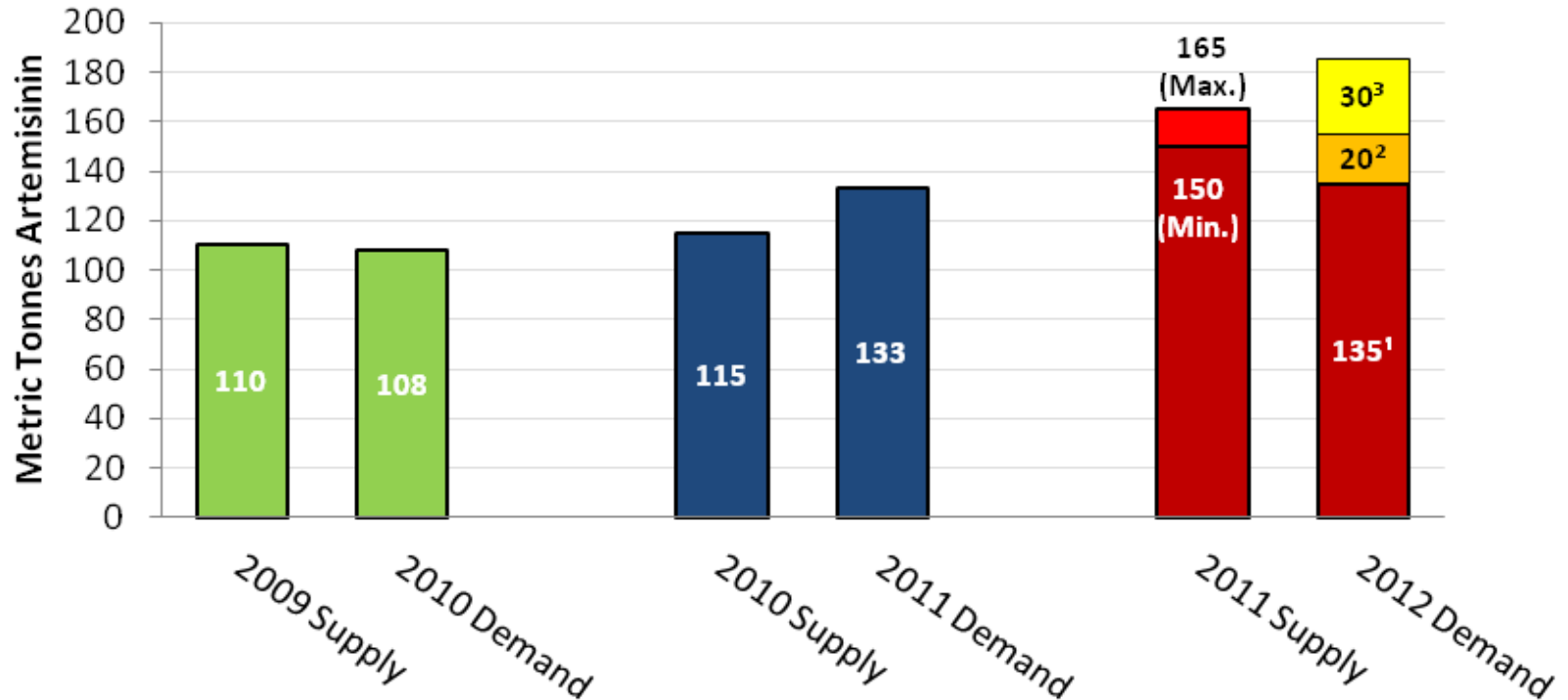
Forecasts Origin / Date	2009	2010	2011	2012
TREATMENTS (Million)				
-CHAI 29/11/2008	115 – 132	157 – 183		
-CHAI 12/2009	179	170 – 196	162 - 214	
-MIT end 2009		209 – 242	211 – 256	
-CHAI 12/10/2010		227	237	229
-BCG-CHAI 08/2011		217	283	292
ARTEMISININ (MT)				
-CHAI 29/11/2008	58 – 67	79 – 92		
-CHAI 12/2009	90	85 – 98	81 – 107	
-MIT end 2009		105 – 121	106 – 128	
-From CHAI 10/2010		113	119	130
-BCG-CHAI 08/2011		108	141	145
-All forecasts in red are not usable for the Artemisinin production as being too late				

Calculation of artemisinin demand

- Conversion rate of artemisinin to API, including 5% process losses:
 - 1 mg Artesunate needs 1.02 mg artemisinin (0.97×1.05)
 - 1 mg Artemether needs 1.74 mg artemisinin (1.66×1.05)
- Sales distribution between the different formulations and dosages which may change regularly.
- To simplify, we use the ratio:
 - 2 million ACT treatments = 1 T Artemisinin
- We add the needs for non qualified products estimated at 20 T but it seems shrinking (AMFm effect)
- Problem with demand to rebuilt the safety stocks

A2S2 - Assured Artemisinin Supply System

A2S2 Artemisinin Supply/Demand Forecast 2009 - 2012



¹Based upon BCG forecast

²Additional demand, including non-qualified ACTs, Indian domestic requirements, etc.

³Replenishment of buffer/safety stocks

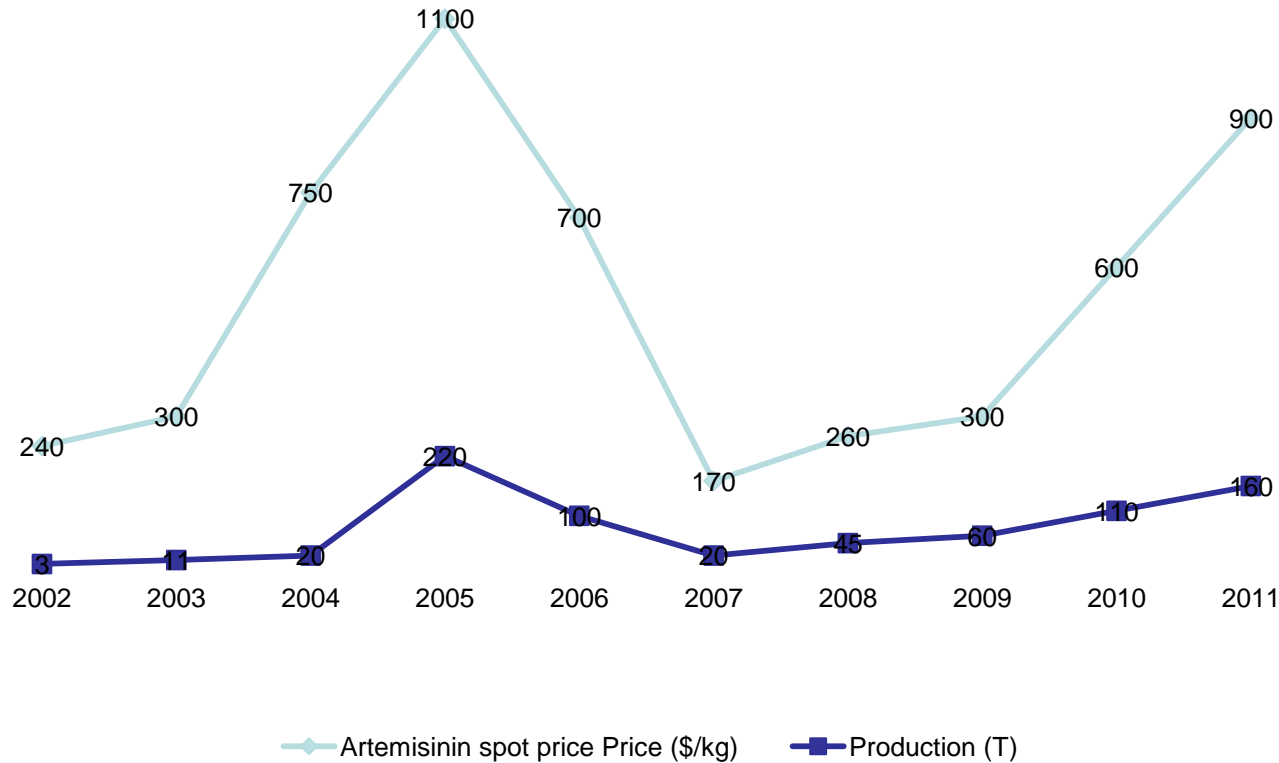
Artemisinin: Balance availability/demand

- For 2010, availability based on the crop of 2009 and still inventories from former harvests at the extractors level.
- In 2011, bad crop in 2010 in China and strong new demand for AMFm from some ACT manufacturers
 - Competition between buyers
 - Needs will be covered by using some stocks.
 - Feeling of a tight situation
- In 2012, new increased demand forecasts for qualified ACTs (BCG 295 million treatments) and still demand for other products (160 T artemisinin in total) could exceed the expected production (150 – 165 T) mainly if ACT producers want to rebuilt safety stocks.

Artemisinin: Balance availability/demand

- In 2012, first semi-synthetic artemisinin available, but only for trials and registration.
- In 2013, semi-synthetic artemisinin available from mid year at the level of 20 – 40 T (?) but mainly to cover demand in 2014.
- Demand to be still covered by natural artemisinin for the biggest part.
- To obtain from the 2012 crop at least 160 T natural artemisinin to be on the safe side.
- Still need to push plantations everywhere

Artemisinin: Relation price on production



Artemisinin price evolution

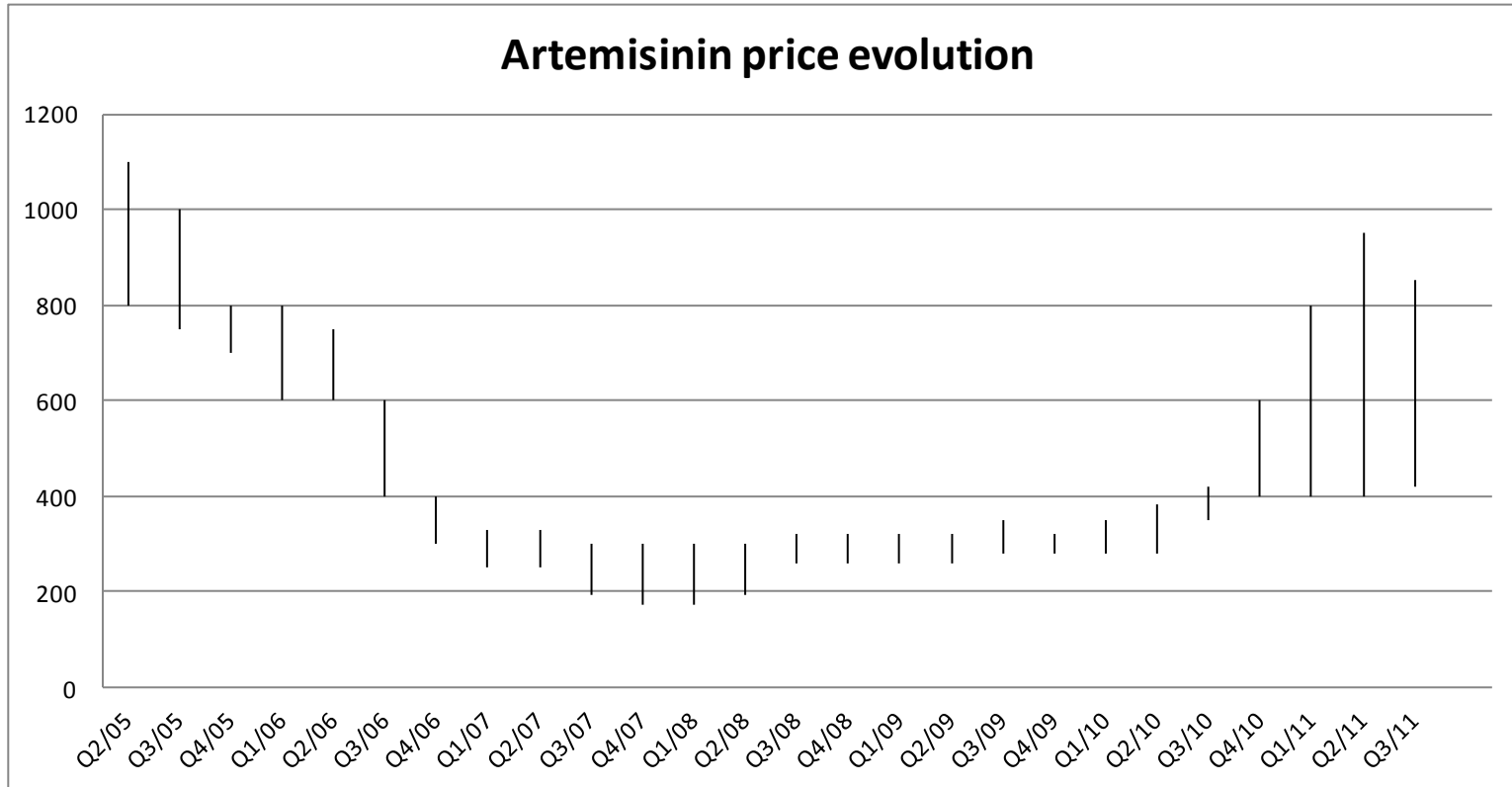
- Main factors for the price increase:
 - Strong demand end of 2010 and beginning 2011 from the API and ACT manufacturers to cover a demand which is not well known by the industry: results of tenders still unknown, AMFm needs not specified to each supplier...
 - Cost of the cultivated leaves: farmers compare the revenue of Artemisia to other food crops
 - Need to gather wild leaves in big quantities to compensate the losses due to climatic conditions, but with a lower content (average -30%)
 - Speculation from collectors:
 - Increase in extraction costs due to lower content in the leaves.
 - Exchange rate: For 1 US\$, extractor receives 6.38 Yuan (6.82 last year) .

Artemisinin production costs in China

	2010	2011
Leaves cultivated \$/T	1000 – 1400	2200 - 3000
Wild leaves \$/T	800 - 1200	2000 - 2800
Content cultivated	0.7 %	0.7 %
Content wild	0.45 %	0.45 %
Other costs / T leaves \$/T	800 - 850	900 - 1000
Global yield	75 % ± 5 %	75 % ± 5 %
Total cost/T leaves	1600 – 2250	2900 – 4000
Kg artemisinin / T leaves	3.4 to 5.2 kg	3.4 to 5.2 kg
Cost/kg artemisinin \$/kg*	307 - 660	557 - 1170

* Very depending on the proportion of cultivated/wild supply for each extractor

ARTEMISININ PRICES RANGE



conclusions

- Natural artemisinin will have to cover the demand for 2013 and partially 2014.
- Still a need to push for plantations end 2011 – beginning 2012 in all growing regions and mainly in China.
- In order to bring back prices at a fair level, need to obtain some stocks over the normal needs.
- To improve processes and promote high yield seeds
- To improve links between the different parties

Thank you.