IMPORTANCE OF WEATHER IN THE SUPPLY EQUATION OF PALM OIL

KEY DRIVERS OF PALM OIL SUPPLY:

- AREA EXPANSION
- YIELD PER HA
  - AGE PROFILE (2-35 TPH)
  - AGRO-CLIMATE (18-30 TPH)
  - WEATHER?

TO ILLUSTRATE:
IF THE CURRENT CPO SUPPLY FROM SOUTH EAST ASIA IS 45 MN TONNES,
A SEVERE EL NINO INDUCED DROUGHT CAN REDUCE YIELD BY 20%
AND THIS WILL WIPE OUT SOME 6 MILLION TONNES OF CPO OFF THE WORLD’S SUPPLY
TODAY’S PRESENTATION

1. GLOBAL PALM OIL PRODUCTION AND SUPPLY DYNAMICS

2. WEATHER AND PALM OIL PRODUCTION, SUPPLY AND PRICES, AND WEATHER-BASED YIELD FORECASTING

3. WILL RECENT AND EMERGING WEATHER AFFECT PRODUCTION PROSPECTS?

4. SUPPLY OUTLOOK FOR 2012/13
GLOBAL PALM OIL PRODUCTION – DYNAMIC SUPPLY GROWTH

- FASTEST GROWING EDIBLE OIL IN THE WORLD
- AVG GROWTH OF 7.8% PER ANNUM (SOYBEAN OIL: 4.2%)
- LOWER GROWTH IN 2009 & 2010 DUE MAINLY TO ADVERSE WEATHER
- SIGNIFICANT GROWTH RECOVERY IN 2011 (10%)
GLOBAL PALM OIL PRODUCTION – KEY PRODUCING COUNTRIES

- Growth is concentrated mainly in South-East Asia (88%)
- Indonesia (47%) + Malaysia (38%) = 85% of world’s production
- Thailand is the 3rd largest producer (3%)
- Malaysia and Indonesia - still the key determinants of palm oil supply to the world

‘MALINDO’ is the Palm Oil Powerhouse of the World
1. RAPID AREA EXPANSION BOOMS GLOBAL PALM OIL SUPPLY

Planted Area Growth
Malaysia : 3.5% pa (150,000 ha/ann)
Indonesia : 6.7% pa (420,000 ha/ann)

CPO Production Growth:
Malaysia : 5.0% pa (0.71 mn tonnes/ann)
Indonesia: 11.6% pa (1.55 mn tonnes/ann)

Malaysia + Indonesia
CPO Growth: 8.1% (2.26 mn tonnes/ann)
OIL PALM EXPANSION BY REGIONS

- Pen. Malaysia: 55%
- Sabah: 31%
- Sarawak: 14%
- Kalimantan: 18%
- North Sumatra: 22%
- Central Sumatra: 38%
- South Sumatra: 19%
2. AGE PROFILE TO DRIVE SUPPLY GROWTH

<table>
<thead>
<tr>
<th>% TOTAL PLANTED</th>
<th>IMMATURE 0-3 YRS</th>
<th>YOUNG 4-8 YRS</th>
<th>PRIME 9-18 YRS</th>
<th>AGEING 19-23 YRS</th>
<th>OLD 24-28 YRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALAYSIA</td>
<td>16</td>
<td>19</td>
<td>39</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>23</td>
<td>26</td>
<td>37</td>
<td>9</td>
<td>5</td>
</tr>
</tbody>
</table>
3. IMPACT OF CLIMATE AND WEATHER ON PALM OIL PRODUCTION

WEATHER IS ONE OF THE KEY FACTORS IN THE SUPPLY EQUATION OF OILSEEDS AND PALM OIL AND AN IMPORTANT CATALYST TO PRICE MOVEMENT
HOW ADVERSE WEATHER CONDITIONS AFFECT PALM OIL PRODUCTION?

PROLONGED DRY CONDITIONS

- 8 to 16 weeks dry: frequently refer to as **EL NINO INDUCED DROUGHT** – caused moisture stress in palms

- Can affect production: some 4-6 MTHS (bunch failure), 10-12 MTHS (floral abortion) and 22-24 MTHS (sex differentiation) after its occurrence - **lagged effect on production**

- Can reduce production up to **30% of normal** - depending on severity

EFFECT OF LOW OR DELAYED RAINFALL ON OILSEEDS IS MORE IMMEDIATE AND SEVERE
# IMPACT OF WET WEATHER ON PALM OIL PRODUCTION

## PROLONGED WET CONDITIONS

- **8 TO 16 WEEKS OF HEAVY RAINFALL:** SOMETIME REFER TO AS **LA NINA OR MONSOON RAINS**

- **CAN AFFECT PRODUCTION:** IMMEDIATELY – disruption of harvesting and logistics, SOME 5-6 MTHS AFTER ITS OCCURRENCE – poor pollination and fruit-sets-

- **lagged effect on production**

- **CAN REDUCE PRODUCTION:** UP TO **15%** OF POTENTIAL YIELD IN SEVERE LA NINA EVENTS

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MILD TO MODERATE LA NINA ARE BENEFICIAL TO PALMS AND ARE USUALLY ASSOCIATED WITH HIGH PALM OIL PRODUCTION
HOW ADVERSE WEATHER AFFECT PALM OIL PRODUCTION AND ITS LAGGED EFFECTS?

DEVELOPMENT OF A WEATHER-BASED FFB YIELD FORECASTING MODEL
IMPACT OF EL NINO ON CPO PRODUCTION IN MALAYSIA

- CPO YIELD CAN DECLINE UP TO 17% Y-O-Y IN THE YEAR IMMEDIATELY FOLLOWING THE COMMENCEMENT OF AN EL NINO EVENT
- LA NINA FOLLOWING AN EL NINO USUALLY ASSOCIATED WITH A SHARP INCREASE/RECOVERY OF CPO YIELD
EL NINO EVENT IS USUALLY FOLLOWED BY A SPIKE IN PALM OIL PRICES (UP 15% -125% )

PRICE INCREASE BY 70% TO PEAK AT RM 3962 PMT IN FEBRUARY 2011 AFTER THE RECENT 2009-10 EL NINO
WILL RECENT AND EMERGING WEATHER AFFECT PALM OIL OUTPUTS IN 2012/13 (INDONESIA)?

**EL NINO, LA NINA AND RAINFALL TRENDS - INDONESIA**

- **SOI**: Southern Oscillation Index
- **EL NINO**: Values <= -8
- **LA NINA**: Values >= 8
- **RAINFALL**: S.SUMATRA, S. KALIMANTAN, C.SUMATRA

Graph shows trends from July 2009 to October 2013.
RAINFALL TRENDS AND ITS INFLUENCE ON PRODUCTION IN 2012 AND 2013

INDONESIA
1. The last El Nino ended in April 2010 and was immediately followed by two consecutive La Nina (July 2010-April 2011 and October 2011- March 2012).
2. The La Nina has brought good rainfall to all key growing regions of Indonesia and encouraged strong growth in 2011 – a record production of 23.9 mn tonnes.
3. The 22-24 months lagged effect of the 2009-10 El Nino has been predicted to have some effects on Q4 2011 and Q1 2012 with some impact on output in 2012 but not severe.
5. With good rainfall in the last two years and neutral weather condition until end 2012, there will not be any serious adverse weather effect on production in 2013 – positive for yield.
WILL PAST AND EMERGING WEATHER AFFECT PALM OIL OUTPUTS IN 2012/13 (MALAYSIA)?
# RAINFALL TRENDS AND ITS INFLUENCE ON PRODUCTION IN 2012 AND 2013

**MALAYSIA**

1. The last El Nino ended in April 2010 and was immediately followed by two consecutive La Nina (July 2010-April 2011 and October 2011- March 2012).

2. The La Nina has brought good rainfall to all key growing regions of Malaysia and encouraged strong growth in 2011 – a record production of 18.9 mn tonnes.

3. The 22-24 months lagged effect of the 2009-10 El Nino plus the strong 2011 La Nina rainfall in Sabah and Sarawak have been predicted to affect the 1\textsuperscript{st} H 2012 output (-9\%) and will stunt the marginal growth in Malaysia in 2012.


5. With good rainfall in the last two years and neutral weather condition until end 2012, there will not be serious adverse effects of weather on production in 2013.
# PALM OIL SUPPLY FORECASTS
## 2012 AND 2013

<table>
<thead>
<tr>
<th>YEAR</th>
<th>CPO FORECAST (MN T)</th>
<th>CHANGE Y-O-Y (MN T)</th>
<th>CHANGE Y-O-Y (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALAYSIA</td>
<td>18.91</td>
<td>1.92</td>
<td>+11.3</td>
</tr>
<tr>
<td>2012F</td>
<td>18.40</td>
<td>-0.51</td>
<td>-2.7</td>
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<tr>
<td>2013F</td>
<td>19.10</td>
<td>0.70</td>
<td>+3.8</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>23.90</td>
<td>1.92</td>
<td>+8.6</td>
</tr>
<tr>
<td>2012F</td>
<td>26.10</td>
<td>2.20</td>
<td>+9.2</td>
</tr>
<tr>
<td>2013F</td>
<td>28.80</td>
<td>2.70</td>
<td>+10.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>42.81</td>
<td>3.82</td>
<td>+9.8</td>
</tr>
<tr>
<td>2012F</td>
<td>44.50</td>
<td>1.69</td>
<td>+3.9</td>
</tr>
<tr>
<td>2013F</td>
<td>47.90</td>
<td>3.40</td>
<td>+7.6</td>
</tr>
</tbody>
</table>

- Based on weather-based forecasting model
CONCLUDING REMARKS

- The 22-24 months lagged effect of the last El Nino has again be felt in the 1st H 2012 especially in Malaysia. This was further aggravated by the strong 2011 La Nina. The residual effect will stunt the output growth in 2012. This effect is less obvious in Indonesia.

- Forecast for 2012: Malaysia : 18.4 Mn T (down 2.7%) and Indonesia : 26.10 Mn T (up 9.2%). Total supply growth for both countries in 2012 will be only 1.69 Mn T.

- With good rainfall in last 2 years and neutral weather until last Q 2012, the palm oil supply is expected to resume its strong growth in 2013, an increase of 3.4 Mn T (7.6%) is forecasted with growth coming mainly from Indonesia (due to its new maturing area and strong age effects)

- Both countries (Malindo) are headed for another record production in 2013 (47.9 Mn T).
Thank you

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Acknowledgements: MPOB, Bursa Malaysia, IPOB, Oil World, OSK Research Sdn Bhd, Plantation Companies (for rainfall data), Bureau of Meteorology Australia

Disclaimer:

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