Topic: “Exploring Forestry in South Africa and Australia – does Precision Forestry apply?”

- Gottstein Award and South Africa Study Trip
- Australia and South Africa – Comparison and Challenges
- Precision Forestry Observations – does it apply?
- Some Conclusions
- A3P
Gottstein Award and South Africa Study Trip

- Gottstein award to explore ‘Precision Forestry’ initiatives in South Africa in March 2010;
- Visit with key SA forestry companies:
  - SAPPI (hardwood plantation grower & pulp and paper processor);
  - Mondi (hardwood plantation grower & pulp and paper processor);
  - MTO Forestry (softwood plantation grower & saw-miller);
- International conference on ‘Precision Forestry’ at Stellenbosch (near Cape Town);
### Australia – South Africa Comparison (1)

Australia is seen as a leader in Oceania - South Africa is seen as a leader in Southern Africa.

<table>
<thead>
<tr>
<th>Forestry Indicators</th>
<th>Australia</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plantation Area (09)</td>
<td>2,020,226 ha</td>
<td>1,274,869 ha</td>
</tr>
<tr>
<td>Species mix</td>
<td>Pine 50.5%</td>
<td>Pine 51%</td>
</tr>
<tr>
<td></td>
<td>Eucalypt 49.5%</td>
<td>Eucalypt 40%</td>
</tr>
<tr>
<td></td>
<td>Wattle 9%</td>
<td></td>
</tr>
<tr>
<td>Ownership</td>
<td>Public 38%</td>
<td>Public 17%</td>
</tr>
<tr>
<td></td>
<td>Private 62%</td>
<td>Private 83%</td>
</tr>
<tr>
<td>New Plantation (09)</td>
<td>47,000 ha</td>
<td>2,169 ha</td>
</tr>
<tr>
<td>Who? (09)</td>
<td>Public 15%</td>
<td>Private 100%</td>
</tr>
<tr>
<td>Last 7 Years</td>
<td>Private 85%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>384,000 ha</td>
<td>25,000 ha</td>
</tr>
<tr>
<td>Log Volumes (09)</td>
<td>25 million m3</td>
<td>19 million m3</td>
</tr>
<tr>
<td>Sawlog (Vol &amp; %)</td>
<td>11.3 mill m3, 45%</td>
<td>4.4 mill m3, 23%</td>
</tr>
<tr>
<td>Pulp/other (Vol &amp; %)</td>
<td>13.7 mill m3, 51%</td>
<td>14.6 mill m3, 77%</td>
</tr>
<tr>
<td>Hardwood/softwood (%)</td>
<td>48%, 52%</td>
<td>60%, 40%</td>
</tr>
</tbody>
</table>
**Australia – South Africa Comparison (2)**

*Note: 1 AUD = 6.9 RAND*

<table>
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<tr>
<th>Forestry Indicators</th>
<th>Australia</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade (Terms of Trade)</td>
<td>- AUD 2.2 Billion</td>
<td>+ AUD 420 Million (R2.91 Billion)</td>
</tr>
<tr>
<td>Major Imports</td>
<td>Sawnwood, paper &amp; paperboard</td>
<td>Paper &amp; sawnwood</td>
</tr>
<tr>
<td>Major Exports</td>
<td>Roundwood, recovered paper &amp; woodchip</td>
<td>Paper, virgin pulp &amp; sawnwood</td>
</tr>
<tr>
<td>Trade Summary</td>
<td>Export raw &amp; import processed</td>
<td>Export processed &amp; import complementary processed</td>
</tr>
<tr>
<td>Population</td>
<td>~ 25 million</td>
<td>~ 50 million</td>
</tr>
<tr>
<td>Official Language</td>
<td>English</td>
<td>11 (Afrikaans, English and 9 African)</td>
</tr>
<tr>
<td>Wages (general worker)</td>
<td>~ AUD$1,000/week (27 x)</td>
<td>~AUD$36/week (R250/week)</td>
</tr>
</tbody>
</table>

**South African Challenges**

- Migration from bordering countries and immigration from South Africa
- AIDS
  - In 2007 est. 5.7 mill South Africans’ had AIDS (12% of population) with some 350,000 dying from HIV/AIDS related illness. [UNAIDS]
- Safety
- Nutrition
Generic International Forestry Challenges

1. Growth in the world’s demand for wood.
2. Global competition.
3. Sustaining environmental values.
4. Interest in forests as renewable energy sources.
5. Markets are becoming more demanding and complex.
6. Shortage of skilled and willing workers.
7. Efficient and effective use of technology.

Precision Forestry Definition

- ‘Precision Forestry uses high technology sensing and analytical tools to support site-specific, economic, environmental, and sustainable decision-making for the forestry sector supporting the forestry value chain.” (Source: Precision Forestry Symposium, Washington 2002)
- The term ‘Precision Forestry’ means different things to different people depending on the person, the term’s use and application within forestry;
**Observations (Precision Forestry)**

**Efficient Technology Application**

- ‘Firehawk’ fire camera detection system
- Application of performance based systems (PBS) in haulage logistics
- Timber and timber product tagging technology for traceability;

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**Observations (Precision Forestry)**

**Sensor Technology**

- ‘Sensors’ is the next huge technology field that will take giant steps forward;
- Aerial, ground based and satellite imagery (such as LiDAR) role in forestry applications;
- Use of GPS and GIS systems for mechanical harvesting control and optimised haulage.
Observations (Precision Forestry)

Targeted Management

- Site matching of species, clonal forestry, and seedlings to specific land type (climate, soil and terrain) ²
- Targeted use of existing technology (such as photogrammetry, GIS) for operational planning;

Synergies

- Out-grower schemes (joint ventures, additional contracted wood) – South Africa;
- Fuel co-operative or centralised purchasing – South Africa;
- Truck haulage optimisation;
South African Harvesting Case Study

- South African harvesting systems is a case in point of the differing definitions of ‘precision forestry’;
- A very low level of machination and technology uptake has occurred in South Africa to date, due in part to:
  - Very cheap labour and govt initiatives for rural employment;
  - High turnover of staff due to churn and disease (AIDS);
  - Availability of finance and lender understanding;
  - Low availability of harvesting systems, new technology, skills and training (in the bush workforce).
- Change is occurring with processor/forwarder systems being introduced in high productivity sites;
- Many years behind other countries.
ForestTECH 2010
South African Site Specific Management Case Study

- South African site specific management is a great example of precision forestry;
- Key Aspects:
  - Comprehensive genetic and tree-breeding program (Eucalypts species and clones);
  - In-depth knowledge of individual sites and productivity;
  - Matching site to tree to silviculture
  - Targeting increased site productivity, pulp yield and desirable pulp characteristics.
- Site specific management has attracted a lot of investment by key plantation companies and been in place for many years and refined over many rotations.
Some Conclusions

- South Africa and Australia have similarities but at the same time vast differences/challenges;
- Widespread application of the principles of Precision Forestry is a necessity to meet forestry’s future challenges;
- Precision forestry means different things to different people;
- Sensor technologies are undergoing a huge technology surge and this should be harnessed by forestry;
- Managers must weigh actual costs versus realistic benefits of precision forestry;
  - Don’t use technology for technology sake, it needs to target outcomes;
  - People, capital and process adoption are often limiting not the technology;
- Thanks to Gottstein Fellowship for the opportunity and I encourage other interested people to apply for awards offered.

About A3P

- A3P - the Australian Plantations Products and Paper Industry Council, is the national representative body for the plantation products and paper industry. A3P’s member companies include plantation growers, wood and specialty plantation products manufacturers (including sawn-timber and wood panels) and paper manufacturers;
- A3P’s Mission is to facilitate the operation and development of an Australian paper and plantation timber industry that is internationally competitive, socially responsible and economically and ecologically sustainable; and to represent the collective national interests of A3P’s members to Government;
- A3P members’ employ more than 13,500 people in plantations, sawmills and paper manufacturing plants, mainly in rural and regional areas. A3P members create and sell more than $4 billion of products, produce more than 12 million cubic metres of logs, 3 million cubic metres of sawn timber and more than 2 million tonnes of paper.
- A3P: www.a3p.asn.au