

# Implementing A Successful Silviculture Modernisation Strategy – Lessons And Opportunities

Dean Da Costa

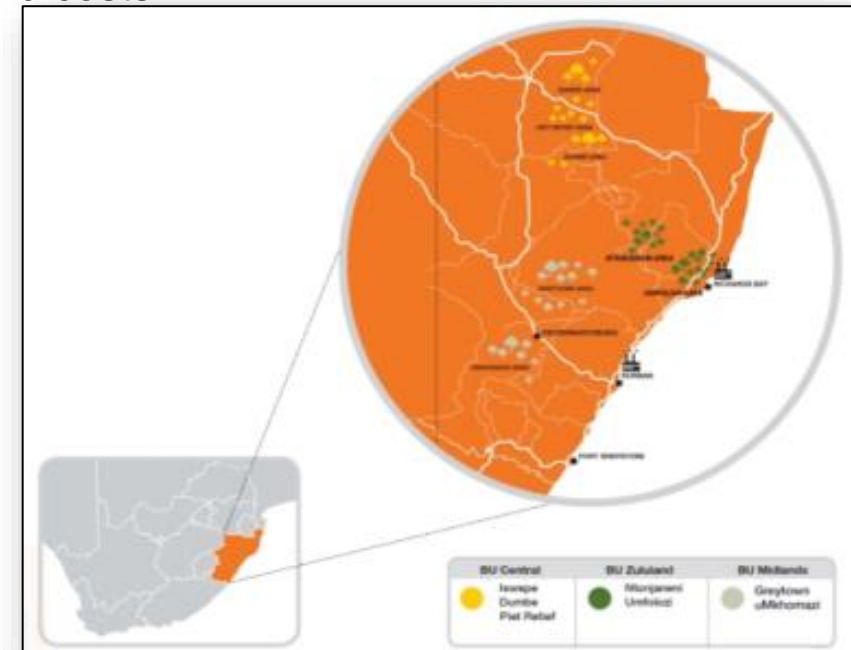
16 October 2024



# Mondi Forests South Africa In Context

The basics

1. Practice intensive short-rotation plantation forestry on 174,000 ha (planted) in South Africa.
2. Invest heavily in establishment, maintenance, crop protection and fire suppression operations.
3. Benchmark well with international competitors as a low cost pulpwood producer.
4. 100% FSC certified since 1997.
5. 100% of operations outsourced since 2002.
6. Modernised operations since 2012. Focus on safety, ergonomic, productivity and costs.
7. Operate in a complex socio-economic and political environment influenced by:
  - a. Land reform.
  - b. Rural unemployment and poverty.
  - c. Water licences.
8. Abiotic and biotic stress factors remain a constant challenge.



# Mondi Silviculture Strategy Goal

The basics

Optimise timber volumes by growing the correct tree species on a sustainable basis, through planned and documented processes

**Reduce The Impacts Of Pest & Environmental Stress**



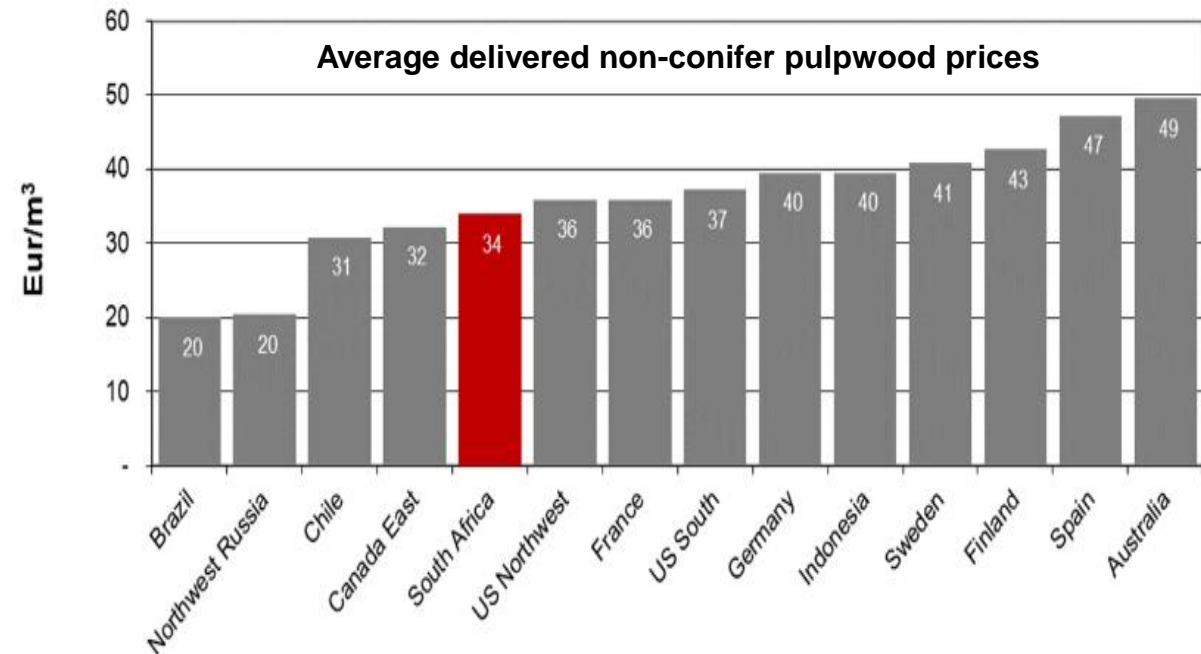
- **Drivers Of A Modernised Silviculture Strategy**
- **Workforce Challenges**
- **Principles Underpinning The Strategy**
- **Focus Areas**
- **Framework For A Silviculture Strategy**
- **Key Areas Of The Framework**
- **Pillars Of The Silviculture Strategy**

# Drivers of Modernised Silviculture Strategy

1. Company policies.
2. Political landscape and public image.
3. Human demands and rising labour rates.
4. Level of silviculture mechanisation strongly linked to the firefighting capacity.
5. Application of sustainable research and advancing technology.
6. High capital costs of imported machinery.
7. Increasing costs of doing business in South Africa.
8. Topography and terrain.



The basics



# Forest Industry Workforce Challenges

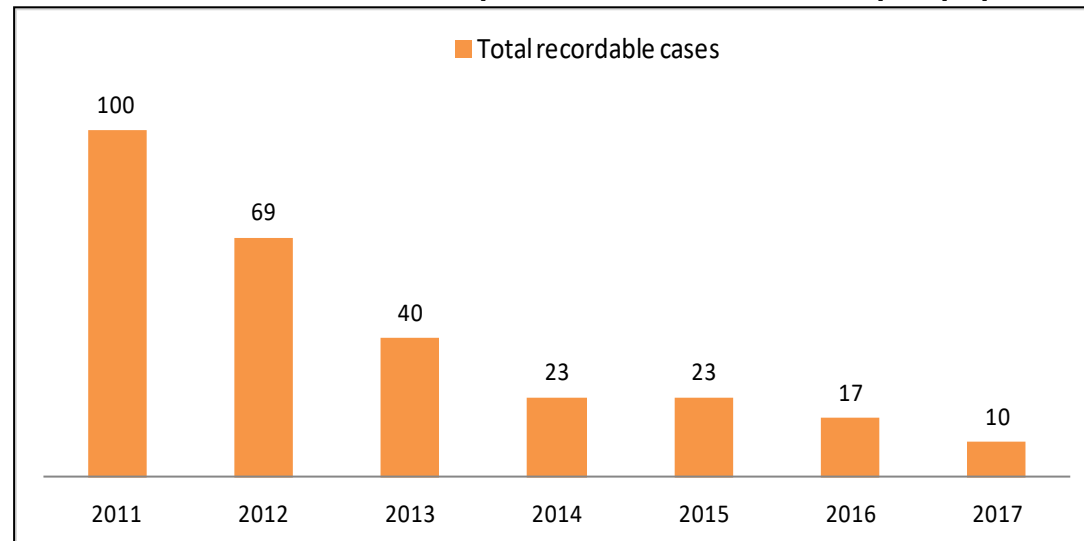
1. Aging workforce & annual decline of  $\pm 5\%$  in the rural population.
2. Increasing labour costs.
3. High labour turnover (20 - 50%) and absenteeism (10 - 20%).
4. Problematic health conditions, impact of HIV/Aids (HIV infection  $>30\%$ ).
5. Productivity and quality challenges of manual operations.
6. Poor ergonomic practice – Move from physically demanding to more cognitive.
7. Safety challenges with chainsaws and sharp tools.



# Principles Underpinning a Modernised Silviculture Strategy

## Introduction of modernisation to silviculture influenced by:

1. Concept of decent work.
2. Improving working conditions through ergonomic interventions.
3. Eliminating safety risks, especially sharp tools.
4. Reducing exposure to harsh climatic conditions & monotonous work.
5. Striving for a more stable and educated work force.
6. Improved productivity & quality optimization of silviculture operations.
7. Remain internationally competitive - Constant innovation to compete as a low cost pulp producer.



# Modernised Silviculture Strategy – Focus Areas

## Safety

- Modernise across all silviculture operations.
- Standardise manual & power tools.
- Phase out un-ergonomic work and reduce sharp tools.

## Productivity

- Standardised establishment operations.
- Productivity & quality improvements through mechanised & semi-mechanised operations.
- Focus on accuracy & quality through increased auditing.

## Technical

- Steep slope & rough terrain silviculture challenges.
- Integrated silviculture technologies (ex. pitting, planting & fertilizing).
- Focus on value chain solutions.
- Cross boundary solutions for high tech, expensive machinery.



# Framework For A Silviculture Strategy

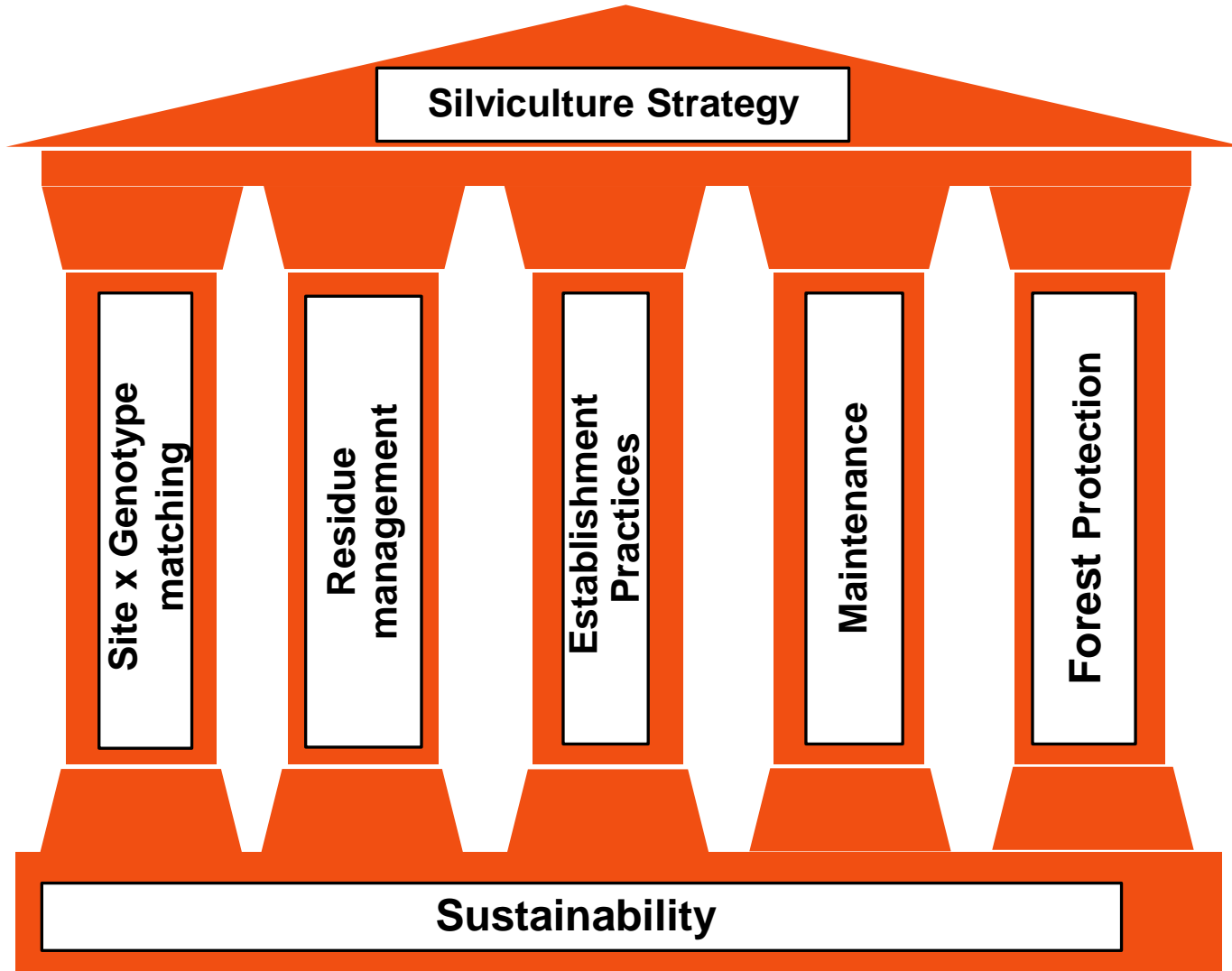
1. Develop a realistic vision for silviculture management.
2. Define the competitive advantage this gives Mondi.
3. Define realistic targets.
4. Focus on systematic growth of the business and reduced timber losses.
5. Make fact-based decisions. Adopt and apply research and technology.
6. Silviculture prescriptions are an essential way forward.
7. Plan long term, act short term.
8. Strategy must be nimble and dynamic.

# Silviculture Strategy – Key Areas of the Framework

1. Adopt environmentally sustainable principles.
2. Silviculture must be based on continual research and development.
3. Strive for self-sufficiency in fibre supply of > 75%.
4. Training and development to receive regular attention.
5. Match every site to the correct genotype - Maximise volume and fibre type.
6. Apply silviculture processes to ensure planting survival of > 95% at 3 months.
7. Health and Safety – Delivery on all silviculture health and safety plans.
8. Forest protection targets:
  - a. Limit environmental and pest threats - Target < 3% loss of total planted area.
  - b. Limit fire threats - Target < 1% of the total planted area.
9. Benchmark internationally – Follower of international best practices.
10. Productivity – Costing models and measurements standardised.

# Pillars Underpinning Mondi Silviculture Strategy

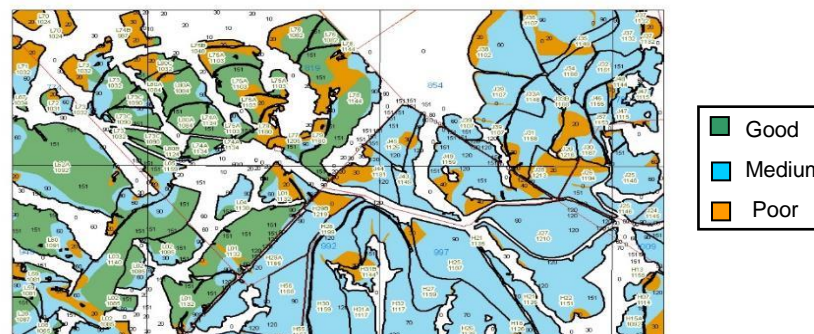
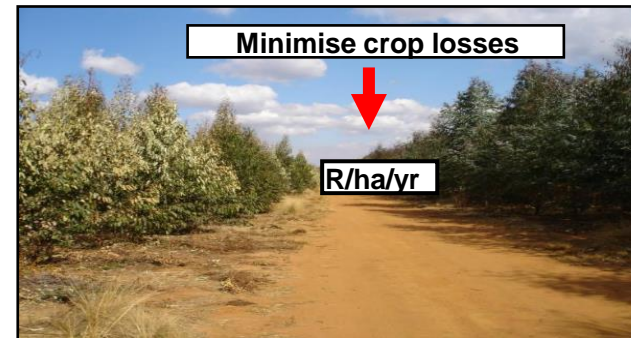
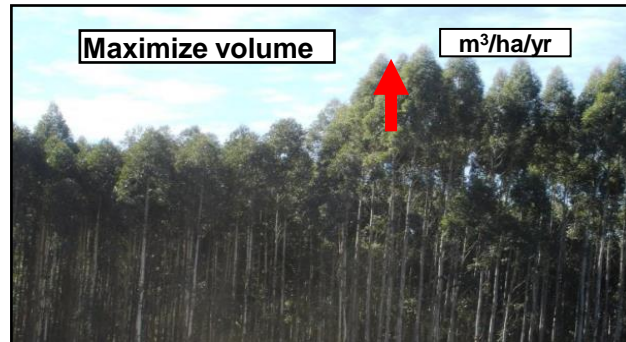
The basics



- 1. Site genotype matching** - Match per site and market requirements.
- 2. Residue management** - Mulch, burn, spread.
- 3. Establishment** - Site preparation, planting, blanking, coppicing, fertilising & pest control.
- 4. Maintenance** - Weed and pest control.
- 5. Forest Protection** - Pest and environmental threat mitigation - **Reduce stress.**

# Pillar 1 – Site x Genotype Matching

1. Site x genotype matching based on the Mondi site classification system.
2. Large monospecific planting to be avoided - Mosaic plantings.
3. Main tenets of site x genotype matching:
  - a. Minimize crop losses due to biotic and environmental stress – Pests, diseases, drought, frost and fire.
  - b. Maximise timber volume ( $m^3/ha/yr$ ) through correct genotype selection.



## Pillar 2 – Residue Management

1. Retention of forest residue as a site sustainability tool for soil health and erosion control.
2. Residue management starts with harvesting and impacts silviculture mechanisation.
3. Strongly governed by fire protection and access for fire fighting.
4. The choice of treatment is influenced by the quantity of woody waste remaining.
5. Burning has a role in residue management but should only be applied where necessary.








# Residue Management

The basics



# Residue Management

The basics

0-20% Slope - Wheeled Option	Above 20% - Tracked Option
	
	
	

## Plant Quality

1. Planting stock will meet specific quality criteria to improve survival, uniformity and growth.
2. Only plants achieving 100% compliance with criteria may be planted.
3. Special emphasis given to root consolidation, mean height, overall robustness and vigour.
4. Plant quality will be adapted to meet specific planting equipment and varying site conditions.



Consolidated plug



Unconsolidated plug



Plant meeting all criteria



Healthy plant but multiple leaders



# Pillar 3 – Establishment Practices

## Establishment - Planting

1. Selection of planting equipment determined by slope, ground roughness, accessibility and financial viability of the contract.
2. Planting equipment must focus on optimal safety, productivity, and ergonomics.
3. Planting stock will be graded and root plugs fully hydrated prior to planting.
4. Planting will only occur where pits meet specifications in terms of depth and soil friability.
5. Integrate planting into a single operation, including, planting, watering, fertilizing, and chemical pest applications.

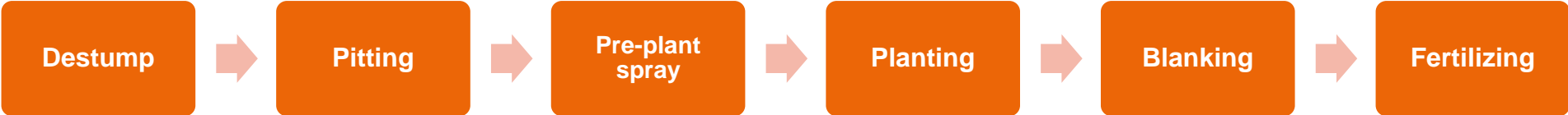


# Pitting And Planting – A Newer Approach



1. Better productivity.
2. Improved ergonomics.
3. Hands not exposed to splinters, chemicals and water.

# Establishment Suite: 0-20% Slope



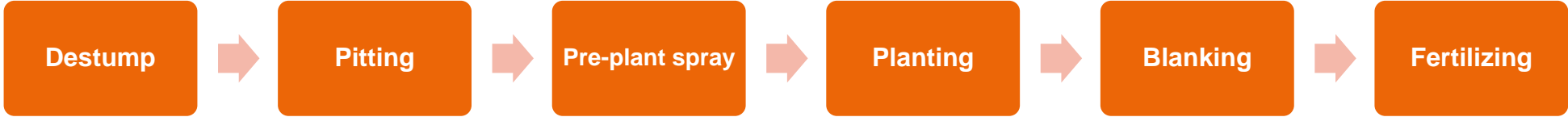
# Semi Mechanised Planting – Flatter Areas



The basics



# Establishment Suite: > 20% Slope



# Semi Mechanised Planting – Steeper Areas

The basics



# Pillar 4 – Maintenance



The basics



# Pillar 5 – Forest Protection

Poor fuel load management the greatest threat!

The basics





# Modernisation Learnings

1. Modernisation goals must be driven by a strategy and not just for the sake of it!
2. Mondi modernisation goals achieved better results than anticipated.
3. Initial resistance - Not all staff and contractors bought into the programme equally.
4. A great degree of innovation by Foresters and Contractors – Absolutely key to success.
5. Concerns over impacts of job losses had to be managed carefully – Mondi Zimele initiative.
6. Some silviculture equipment did not work as envisaged – Accept that there will be failures.
7. Develop multi skilled employees going forward.
8. New roles and responsibilities for Supervisors – Very challenging.
9. Training programmes essential – Severity of potential injuries through mechanisation increases.
10. Productivity studies of modernised operations must be a key focus.
11. Focus on attention to detail and planning - Structured auditing essential.
12. You're never fully modernised – that's an ongoing process!



**Thank you!**