Forest Biofuels: A Green Resource?

Fire Hazard Implications when using Plantation Biomass

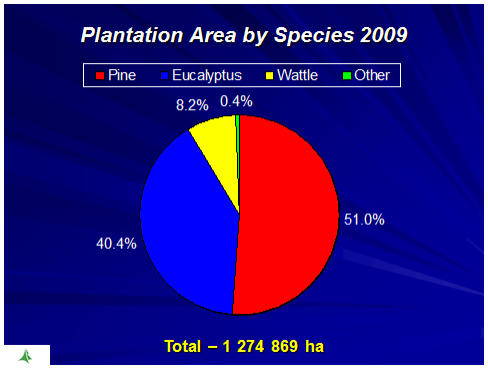
Pre- Fire

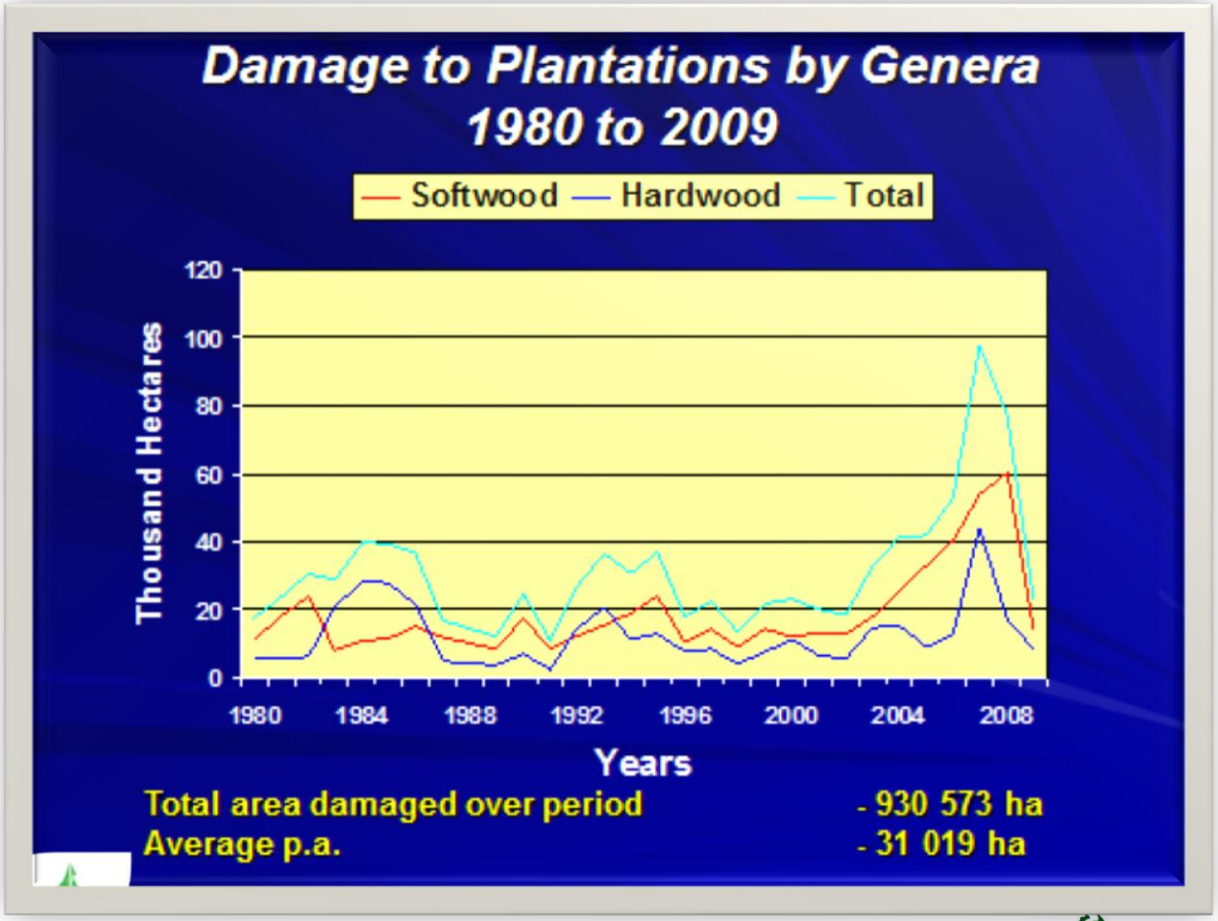
Plantation Fire Risk Management

FORESTRY SOLUTIONS

Growing Lifetime Partnerships

RSA Fire Damage area





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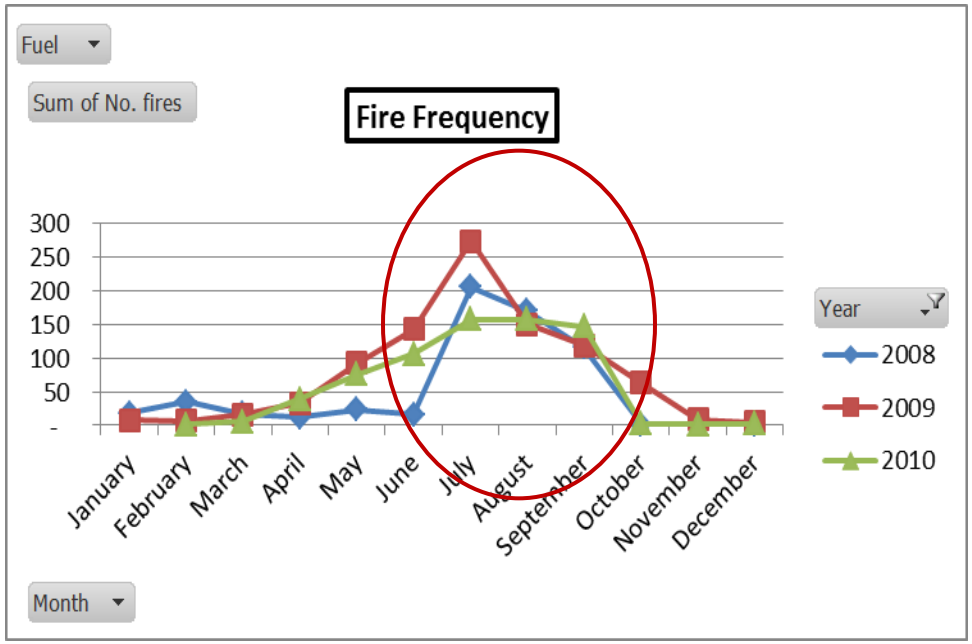
Fire statistics (KZN)

Sum of No. fires	Year			
Month	**2008**	**2009**	**2010**	Grand Total
January	18	8		26
February	35	7	2	44
March	17	16	6	39
April	12	33	39	84
May	23	92	76	191
June	16	143	106	265
July	205	273	157	635
August	170	150	157	477
September	115	119	147	381
October	1	63	3	67
November	1	9	1	11
December	2	5	3	10
Grand Total	**615**	**918**	**697**	2 230



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Causes and cost to contain fires

Sum of Total cost	Year			
Cause	**2008**	**2009**	**2010**	Grand Total
Brushwood	2 584	64 936	168 248	235 768
Firebreak	94 705	70 653	410 452	575 810
Flare-up	166 428	180 308	247 352	594 088
Suspected grazing		24 630	290 512	315 142
Grand Total	**263 717**	**340 527**	**1 116 564**	1 720 808

Fuel reduction

Fuel types

Fuel reduction methode		1 hour	10 hour	100 hour	1000 hour
Weeding	2-20 t/ha	■			
Grazing	2-20 t/ha	■			
Fire break burning	2-20 t/ha	■			
Under canopy burning	16 t/ha	■	■		
Muching	20-80 t/ha	■	■		
Fire wood collection	20-80 t/ha		■	■	
Burn after harvesting	60-400t/ha	■	■	■	■
Biomass removal at harvesting	60-400t/ha		■	■	■

Litter	% total weight
Leaves	**6.0**
Bark	**17.6**
Capsules	**4.0**
Br. & Twig	**31.3**
Duff	**41.2**
Total	**100.0**

All about fuel

Fuel reduction

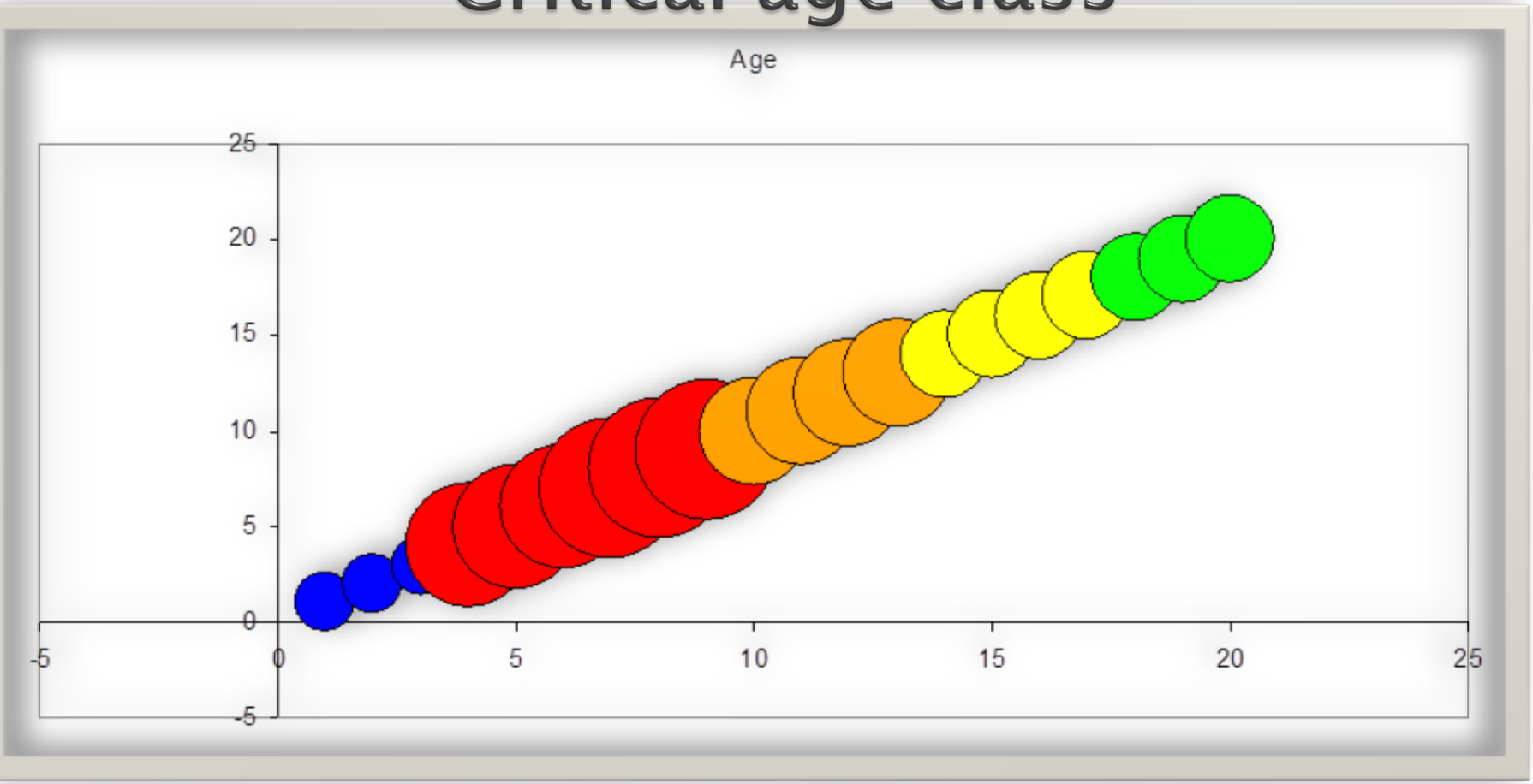
- Weeding
- Mulching
- Slashing
- Grazing

Fuel removal

- Slash burning after harvesting
- Under canopy burning Pine/Gum
- Fire wood collection
- Fire break burning

New tendency is to create strategically placed low fuel load zones (Buffer Zones) to reduce the rate of spread

Critical age class



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Fuel management mulching

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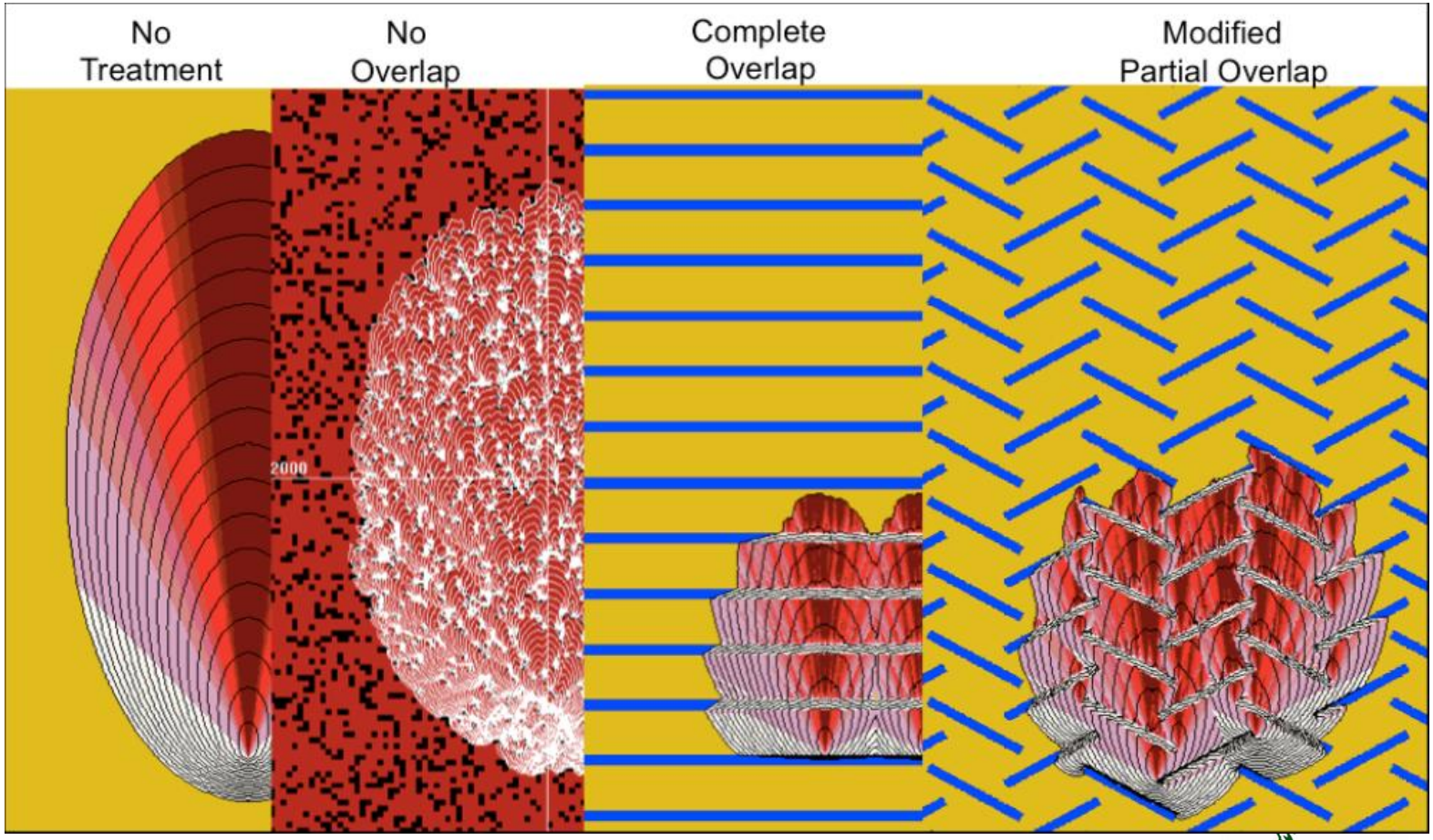
Fuel management burning

Impact of Buffer zones on ROS



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To avoid .....

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Management impact

Silviculture practices

- Pruning
- Coppicing
- Delayed weeding

Increase 1-10 hour fuels in plantations

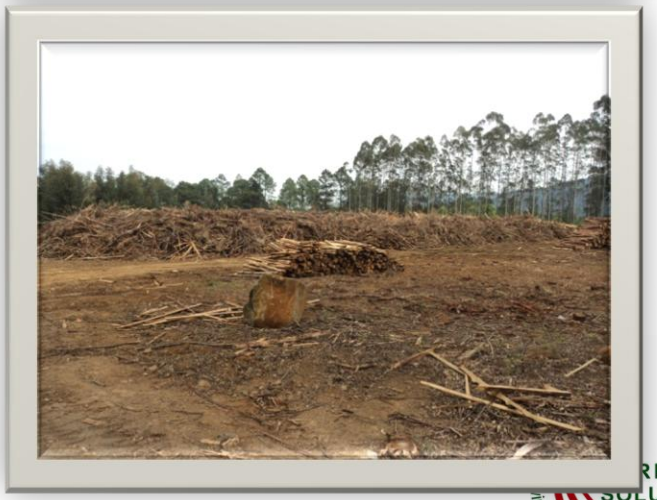
Standard practice – Burning after harvesting

- Benefits
  - Cost effective
  - Clean site to establish
- Concerns
  - Damage to site
  - Air pollution
  - Risk of run away fires
  - Prohibition period (Nov– May)
  - TU – 7 months

Opportunity for Bio fuel harvesting

- With clearfelling operations
- Salvage operations after fire damage
- Clearing of overgrown conservation areas

Is this what we have in mind ?



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Available biomass after clearfelling

Implications when using Biomass at harvesting

- Silviculture
  - Reduced TU period
  - Less weed infestation ?
  - Cheaper establishment

- Fire hazards
  - Less high fuel during winter
  - Low fire intensity
  - Low ROS
  - Easy to contain
  - Cheaper mopping up cost
  - Overall fuel load reduce
  - Mosaic of low fuel loads
    - Rate of spread
  -

Concerns

- Harvesting systems must change
- Cost implications
- Logistics to deal with volume
- Lead time to get site cleared

In conclusion

- Bio fuel utilisation holds opportunities in:
  - Reestablishment
  - Fire management
- Harvesting and Silviculture systems require integration.
- Harvesting systems need to be adapted to allow cost effective removal of biomass
- Will have to change to whole tree harvesting systems with processing on roadside/depot

Thank You