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## What's in a Christmas Tree?

By Wayne Jones

Over the centuries, the Christmas feast, which fills the souls of millions of people, especially children with joy, became loaded with many traditions and symbols. This feast is accompanied by the fresh aroma of the Christmas tree, making it the most important part of the Christmas ritual. The United States of America is by far the largest producer and consumer of Christmas trees, but these figures are also high in Germany and Canada. Australia is a relatively new market for Christmas tree farms.

The bulk of all Christmas trees, in fact 98%, that are bought worldwide come from tree farms and only 2% are cut from the wild. Hopefully, soon all Christmas trees will come from specialized tree farms, especially considering how important it is to protect the environment and the tree species that are already endangered. In the USA, there are more than 15,000 Christmas tree farms alone, with sales that exceed 1.0 billion USD.

Christmas trees are popular all over the world, but some species can easily be considered as being the most popular. Traditionally, the pagans and Christians used the fig tree during the celebration of winter festivals. The firs are considered the most suitable species for Christmas decorations and celebrations and these include *Abies nordmanniana* (Nordmann Fir), *Abies procera* (Noble Fir), *Abies fraseri* (Fraser Fir), *Pseudotsuga menziesii* (Douglas Fir), *Abies pirisapo* (Spanish Fir), and *Abies balsamea* (Balsam Fir). These types of fir trees are suitable since they have aromatic foliage. They also do not shed many of their needles when they get dry. This is in line with Christmas tree breeding programmes where breeding superior genotypes with picture-perfect architecture, strong aroma, blue-green color, and excellent needle retention are the main objectives. New research into tolerance to various *Phytophthora* strains and identifying markers for needle retention using molecular techniques are being implemented. Propagation is also swiftly moving from open pollinated seed to control pollinated seed and vegetative propagation to produce trees with predictable outcomes.

Pine species are also popular as they are evergreen and bear cones. Two species, *Pinus sylvestris* (Scotch Pine) and *Pinus virginiana* (Virginia Pine) are commonly used as Christmas trees in North America. The reason for this is that they have stiff branches, which can hold heavy ornaments. Furthermore, their needles stay green for about four weeks. When the needles dry, they do not fall. Another significant reason pine trees are great for Christmas tree lovers is that they have an aromatic scent. Other species that are popular include *Picea pungens* (Colorado Blue Spruce) and *Picea glauca* (White Spruce). Included here are the beautifully shaped cypress tree species such as *Cupressus x lelandii* (Leylan Cypress), *Cupressus arizonica* (Arizona Cypress) and *Cupressus glabra* (Blue Pyramid Cypress). Not to be

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forgotten for their piney aroma *Juniperus virginiana* (Eastern Red Cedar) makes an ideal Christmas tree. The short bluish green needles of *Cedrus deodara* (Himalayan Cedar) is popular in both the north and south.

Christmas in the south is usually associated with the outdoors, hot weather and artificial look-alike Christmas trees, however some real trees are included with the most popular being *Cryptomeria japonica* (Japanese Cedar) followed by *Cedrus deodara* (Himalayan Cedar). In Australia many native tree species are equally suitable to replace traditional exotic or artificial trees to hang lights and decorations indoors or outdoors and these include *Araucaria heterophylla* (Northfolk Island Pine), *Callitris oblonga* (South Esk Pine), *Adenanthos sericeus* (Wolly Bush), *Persoonia pinifolia* (Geebung) and *Wollemia nobilis* (Wollemi Pine).

Similarly, in South Africa the usual mad scramble for an authentic tree will result in a very bad looking *Pinus patula* (Mexican Weeping Pine) dropping needles and decorations all over the floor. Better still is a well-selected natural regeneration of either *Pinus pinaster* (Cluster Pine), *Pinus elliotii* (Slash Pine) or *Pinus taeda* (Loblolly Pine), which will more than suffice the duration of the celebrations. The ultimate is decorating an indigenous tree in your garden or planting a tree every year. Top of this list are our very own yellowwoods taking first prize and include *Podocarpus henkelii* (Henkels Yellowwood) and *Podocarpus falcatus* (Outeniqua Yellowwood).

**BEST WISHES FOR THE FESTIVE SEASON!**

## Implementing Cambodia's National REDD+ Strategy

By Rob Morley

Over the past 18 months, after working exclusively in Africa for 25 years, I have been working on a project to implement Cambodia's National REDD+ Strategy (NRS). My background is broad wildlife management and landscape ecology which fits the Cambodian context as forestry falls under protected areas, production forests and fisheries (flooded forests and mangroves are the remit of the Department of Fisheries given their importance for fish stock maintenance).

Cambodia has experienced rapid economic growth in recent years, however, there is a downside to this development; serious environmental degradation has taken place in parallel and a clear indicator of the magnitude of the problem is a significant change in forest cover. Between 2010 and 2014, Cambodia's forest cover decreased from 57% of the country's total land area to 47% – this represents one of the highest deforestation rates in the world.

Perhaps the biggest driver is forest clearance under Economic Land Concessions (ELCs), with areas (sometimes blocks of 5,000 – 12,000 ha) of moist tropical forest converted to rubber plantation, or stripped of high value timber species and then cleared to secure title to land. ELCs are no longer being granted and many are being revoked, but the damage to forest has been widespread. Other drivers of deforestation include conversion to agriculture, illegal logging and 'land-grabs'.

More recently the Royal Government of Cambodia (RGC) has actively included the prioritization of action on climate change in its national policies, specifically in the National REDD+ Strategy (NRS) adopted in 2017, with an objective of reducing annual deforestation by 50% (compared to the national forest reference level (FRL) period of 2006–2014) by 2026, and thereafter increasing forest cover.

I am part of a team that developed an action and investment plan to implement the NRS, including the activities needed and costings of these. The government and as importantly civil society, is focusing on conserving existing forests and expanding forest cover.

We are now looking as a next phase, on implementation at provincial level in the north east of the country and are reaching out to partners in government, the main overseas development agencies and the private sector. Interestingly the private sector includes both South African foresters and other forestry experts who trained or studied in South Africa.

Plantation forestry is not well developed but there appears to be a lot of potential for growth, although there are challenges with respect to land tenure and ownership and as elsewhere, the volume of red tape that has to be mastered.

On a personal level, it has been interesting to experience gained in Africa to another region and to realise that there is great scope for sharing ideas and experience – we have developed some important models and practices in Africa that can be shared with other regions, and conversely, we can gain new insight from the way other countries and regions operate land use, land use change and forestry.



## The combined effect of slash burning and repeated disc harrowing on changes in fuel loading, soil properties, root growth and stand productivity of eucalypts in Mpumalanga: South Africa

by By Angel A. Goldsmith and Ben du Toit

In 2019, the SAIF/William C. Teie Forestry Bursary was awarded to Angel Goldsmith for his fire-related research. Here we receive some feedback on the results of his studies.

In many South African plantation forestry regions, repeated disc harrowing (after clear felling and during stand development) is used as a fuel load reduction measure to minimise wildfire damage. A study by Angel Aphelele Goldsmith from Stellenbosch University under the supervision of Professor Ben du Toit was conducted to quantify the effects of repeated disc harrowing on fuel loading, soil properties and stand growth.



The implementation of repeated disc harrowing throughout the rotation of *Eucalyptus grandis x nitens* stands significantly reduced fuel loading of the most reactive (i.e. the finer) fuel classes. In a fence line study of adjacent experimental plots, repeated disking (BD) was contrasted with non-disking (B0) treatments. Repeated disc harrowing reduced the average oven dried fuel loading of the 1 hour fuel class by 29.0 t ha<sup>-1</sup> and that of the 10 hour fuels by 4.3 t ha<sup>-1</sup> when compared to the non-disked treatments. Repeated disc harrowing significantly altered the forest floor structure. The non-disking treatment consisted of the litter (L), fermented (F), and humus (H) strata on top of the mineral soil (MS) layer. Following numerous harrowing applications in the BD treatment, the forest floor structure was reduced to only a sparse L layer directly on top of the MS layer. This indicated a considerable change in fuel loading and forest floor structure as a result of disc harrowing.



Repeated disc harrowing significantly increased topsoil exchangeable cation quantities, S-value, and reduced bulk density. Topsoil exchangeable K, Ca, Mg, Na, and S-value increased by 0.04, 0.34, 0.12, 0.01 and 0.51 cmolc kg<sup>-1</sup> respectively following repeated disking. It follows that disking increased the speed by which base cations are recycled back to the soil followed by an increase in the rate of mineralisation of organic residues. The topsoil pHKCl, extractable P, total N and C were not significantly different among the two treatments.

The above and below ground tree growth variables examined in this fence line study indicated no significant differences following repeated disc harrowing treatment. The BD treatment exhibited similar stand density of 1168 stems ha<sup>-1</sup> over 1141 stems ha<sup>-1</sup> for B0 treatment. Likewise, stand productivity was similar among treatments, with basal area, volume, and plant biomass in the B0 treatment being 24.6 m<sup>2</sup> ha<sup>-1</sup>, 212.5 m<sup>3</sup> ha<sup>-1</sup> and 134.4 t ha<sup>-1</sup> versus 23.5 m<sup>2</sup> ha<sup>-1</sup>, 202.6 m<sup>3</sup> ha<sup>-1</sup> and 127.5 t ha<sup>-1</sup> for the BD treatment. Using a profile wall root study method, B0 treatment was observed to have a non-significantly higher root abundance of 30% on the top 10 cm soil depth when contrasted to BD treatment, which had an abundance level of 22% (percentage of the total root count on a 1 x 1 m vertical profile wall). The BD treatment compensated somewhat for this effect through a non-significant increase in root abundance in deeper soil layers (20–30 cm). All the differences observed on the tree growth and stand productivity parameters among the two treatments were not significant at (p<0.05). The negligible growth reduction in repeatedly disked treatment is surpassed by the significant fuel load reduction and reduced wildfire risk.

A full Master's thesis manuscript has been submitted and accepted at Stellenbosch University. Two scientific articles are being prepared for publication in peer reviewed science journals from this project.

## Apocalypse now?

By Rob Thompson

I hope that many readers of this article have had the opportunity to watch the recent TV series "Chernobyl".

If you haven't yet done so then you owe it to yourself to do so. You are certainly in for a treat!

But hang on a sec...this is a forestry related newsletter not a TV programme review guide, so what relevance the comments above?

You make a good point so bear with me as I try and provide such relevance.

The series describes and no doubt embellishes on the events surrounding the Chernobyl Nuclear Power Plant disaster that occurred in its no. 4 reactor in April 1986. This disaster, near the city of Pripyat in the north of the Ukrainian SSR is viewed as one of the worst nuclear disasters in history. The series explores the cause of the disaster which was attributed to a failed simulation safety test conducted in order to develop a procedure to maintain water cooling of the reactor in the event of a power outage and before back up power started.

The hapless engineers conducting the test were not to know that:-

- 1) a co-incident widespread power outage at test time would prevent back-up generators from working (did someone mention Eskom?)
- 2) the fail-safe reactor shutdown mechanism was poorly designed and that apart from not shutting down would cause a nuclear chain reaction and a superheated steam explosion
- 3) the test instructions they were following were edited to not reveal a series of three previous similar, but failed tests
- 4) their superiors would deny the extent of the disaster despite the chaos and radioactive mayhem ensuing.

The series further explores the attempts by Valery Legaslov, Chief of the Investigative Commission into the disaster, to have the event fundamentally and officially recognised as a nuclear disaster by the government and authorities and to have the long-term and life-threatening dangers recognised. As denials and prevarications gained momentum, so did the exposed reactive graphite on lying on the ground and amongst rubble, start to indirectly kill firefighters called in to attend to what was portrayed as a mere reactor fire. The fire was in fact no fire. It was a live nuclear reaction that could be seen for miles in the form of a beautiful (deadly) aurora that actually attracted many onlookers out to enjoy the spectacle and allow their children to frolic in the thick soft (highly reactive) attractive ash that descended from the sky. A poignant scene in the series shows scores of onlookers, some with babies in arms, gazing out onto the aurora from a railway bridge which legend holds is now called the "Bridge of Death".

Legaslov eventually drilled home to authorities the fact that this was a deadly disaster and that exclusion zones should be created, top soil layers over vast areas be buried under sub-soil, reactive graphite collected and entombed in zinc, lead and concrete layers, domestic and indigenous animals to be culled and similarly entombed and cooling water reservoirs to be closed off forever from natural streams and underground water sources. What he failed to do was get the government to admit to the disaster to the rest of the world and to acknowledge the design fault in the fail-safe reactor mechanism. A design fault that was in fact in place at least four other reactors within the Soviet Republic.

Legaslov was forced into a house arrest situation and spent the time secretly recording all the facts that he had uncovered. He managed to pass on these tape recordings to a scientific colleague for distribution in world-wide nuclear scientific circles (no internet in those days). On the second anniversary of the disaster, he committed suicide and would never see the "great reveal" when his records caused the Soviets to acknowledge and rectify the design faults and protocols they had known about for so long (I hear some of you saying "State capture!"). No one knows for sure how many deaths were caused by this disaster due to the indirect nature of the

radioactivity leading to cancers and other afflictions. Some pundits say it is not impossible that the death toll has run into 100 000 plus to date.

Wow, what a depressing topic for an SAIF article. Yip but a challenging one because I see the Chernobyl disaster as a metaphor for what is happening in our lives, here, today.

"Never" I hear you say, "Koeberg is perfectly safe. We cannot have a similar disaster there!"

Maybe, but I'm not necessarily talking about a nuclear disaster but certainly an environmental disaster that may affect far more people than Reactor no. 4.

Let's call this Environmental Reactor 1. There is only one and there is no known fail safe mechanism. We are all dependent on it. It demands to be run at an optimum sustainable level beyond which a tipping point is surpassed and signs of reactor failure begin to present. Push it well beyond the tipping point and suffice it to say that you will likely be buying sea frontage property in Pinetown before too long.

A small town on the Namibian border called Vioolsdrif measured a temperature of 54 degrees C this week. Wild bushfires have and are causing mayhem in USA and Australia. The tourist mecca and "Capital of Romance", Venice, has been flooded by rising sea levels twice in the past month. Six destructive and deadly tornadoes have hit various parts of the RSA in the recent month. Yes, you heard that correctly...tornadoes ... in South Africa! The Victoria Falls on the mighty Zambezi have been reduced to a trickle as the country experiences the biggest drought in living memory. KZN over recent weeks was blessed to receive hundreds of mm of welcome rain and we all heaved a collective sigh of relief that the fire season was now at an end. Day temperatures suddenly began to reach the early 40's and recent days have seen an onset of destructive plantation fires.

The custodians of Environmental Reactor 1 take no heed to all of these warning bleeps. They continue to produce plastic as a convenience allowing the used-once material to clog waterways, choke vast areas of the sea and end up as nano-particles in our drinking water resources. No-one hits the "Terminate plastic for alternatives" button.

The "Enforce Legislation" button does not appear anywhere on the control panel allowing rampant unchecked development and pollution to sully natural areas and impact on bio-diversity. Reactor 1 is getting both warm and dirty. Natural cooling processes are becoming dysfunctional.

The "Produce at all costs" lever on the panel appears to be one of the most used controls available, well...besides the "Consume beyond your means" throttle that is.

And so it continues. The control room being used to push Environmental Reactor 1 to the limits but sadly not merely to test it. The converse to reactor 4 is that the manual actually stipulates how to run Environmental Reactor 1. Instructions of past failures are not hidden. They are well known and researched and are there for all operators to see and access. Results of overload are well known. Affected people and eco-systems have been studied and analysed. Here there is no cover up.

Here however, in the control room is a distinct lack of will to manage Reactor 1 properly. The light behind the "Care for the environment" toggle is cracked and the lever arm is jammed through lack of use.

You and I have no need to send each other secret messages or revelations. The message is out there. The will is not.

May it be that the Designer of Environmental Reactor 1 has indeed built in a hidden failsafe that kicks in when the reactor finally stalls in the not too distant future. Either that, or we need a warning bleep of such magnitude that it pulls us all out of our stupor and forces our hands onto the correct controls without further delay.

Phew! Well despite this doom and gloom may you and yours have a wonderful festive season, find time to relax and re-focus ready to come back next year and do the right things, right, first time.

## SAIF photo competition 2019

We can finally announce the winners of the SAIF photo competition for 2019, with the prizes sponsored by Stihl. The photos will be used for the 2020 SAIF calendar. The top 15 people are listed below, with the first three receiving prizes (photos shown below in order of winning). They will be contacted by their branch chairs.

1. GERRIT POOL (S Cape): STIHL RE 88 High Pressure Washer
2. PHILLIP FISCHER (Mpu): STIHL HSA 25 Cordless Shrub Shears
3. IZETTE GREYLING (KZN): STIHL SE 62 Vacuum Cleaner

The other members whose photos will appear in the calendar are MAURITZ PEROLD, SIPHELELE MASONDO, JOLANDA ROUX, PHILLIP FISCHER, JACO-PIERRE VD MERWE, COERT GELDENHUYS, ROBIN HULL, BARRY MULLER, IZETTE GREYLING, DARRYL HERRON, ANDREW McEWAN, and W.R. BAINBRIDGE.

SAIF members: **NEW** benefit

By Hannél Ham

NISC, the publisher of our journal (*Southern Forests: a Journal of Forest Science*), introduced a new online system for paid up SAIF members. This will entail that members can create a unique or personalised login on the Taylor & Francis website with access to previous published volumes of *Southern Forests*. Most libraries at academic and research institutions with active subscription to *Southern Forests* only have online access to volumes published after 2000. Currently members have access to volumes between 1997 and 2019. However, NISC is continuously uploading older volumes. Access of paid-up SAIF members will be automatically renewed annually on 1 January.

To activate this special benefit, members need to be paid-up and have a valid email address. It is, therefore, very important that members update their details on the membership database (<http://saif.org.za/member-database/member-area>) to make use of this added benefit. Kindly contact me ([hamh@basicr.co.za](mailto:hamh@basicr.co.za)) if you experience any problems with the login process when updating your details. If you are in doubt, whether you are a paid-up member, kindly contact Corine Viljoen ([saif@mweb.co.za](mailto:saif@mweb.co.za)) for assistance. NISC provided the following press release:

*Southern Forests* can be accessed online via a username and password. Online access is linked to respective members email addresses, the one the society has on record. If you have accessed the journal online before, you can go to the following site and reset your password for access: <http://www.tandfonline.com/action/requestResetPassword>

If you have never accessed the journal online, you will firstly need to register an account using the email address on which we have set up your subscription. To register, please follow the instructions below.

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- Once you have submitted your registration form, a confirmation email will be sent to the email address you registered with. This will contain a validation link to activate your account. Unfortunately, these emails can be caught in spam filters. Please check this and add @tandfonline.com to your safe senders list.
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- Once you are logged in you can also sign up to receive new issue alert emails. To sign up, visit the journal homepage [www.tandfonline.com/tsfs](http://www.tandfonline.com/tsfs) and click on the 'New Content Alerts' button.
- If you experience any problems, you can email [journals@nisc.co.za](mailto:journals@nisc.co.za)



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## December/January 2019 birthdays



02-Dec	CHAPMAN C.	20-Dec	ACKERMAN S.A.
02-Dec	HEATH R.H.	20-Dec	ALGERA M.
02-Dec	VON KROSIGK F.K.	20-Dec	DAVIDSON W.N.
03-Dec	BESTER J.J.	20-Dec	LE BRASSEUR J.
03-Dec	MONNIG N.H.	25-Dec	DLAMINI C.
05-Dec	LYLE G.R.	25-Dec	STRYDOM H.L.
05-Dec	MARIBA T.	30-Dec	HURLEY B.P.
05-Dec	VERMEULEN W.J.	30-Dec	PANNIFER W.P.
06-Dec	JAKAVULA M.G.	03-Jan	BALLANTYNE J.R.
09-Dec	RETIEF F.	06-Jan	MORTIMER J.H.
10-Dec	ODENDAAL P.B.	08-Jan	KOTZE W.
10-Dec	VIERO P.	08-Jan	KRUGER P.
11-Dec	MASON M.J.	08-Jan	ROOTHMAN D.
11-Dec	SCHOOMBEE P.W.	09-Jan	NORRIS C.H.
12-Dec	HERRON D.	10-Jan	SWAIN T.
14-Dec	ROGANS D.M.	11-Jan	BADENHORST J.E.F.
15-Dec	FISCHER P.M.	11-Jan	ODELL P.
15-Dec	PEROLD M.	12-Jan	DOBSON D.
15-Dec	THEART G.F.	12-Jan	VERSFELD D.B.
18-Dec	LOUW J.H.	13-Jan	VON BUDDENBROCK P.E.
19-Dec	MALLOCH-BROWN D.	15-Jan	MALAN F.S.