

# Pest hunting in Zululand



Izette Greyling (Extension officer for the TPCP) (centre), and Veracious Mabasa (right) and Khanyisa Vundle (Saasveld forestry students doing practical work at FABI) searching for pests in Zululand.

We keep hearing that there are more and more pests and diseases affecting plantations around South Africa, but it's only when you look closely that you realise the full extent of the threat.

**S**A Forestry magazine met up with Izette Greyling of the Tree Protection Co-operative Programme (TPCP) in Zululand recently during one of her frequent field trips to monitor the spread of pests and diseases in commercial tree-growing areas.

One of her objectives was to check on the spread of two insect pests, *Leptocybe invasa*, better known as the Eucalyptus Gall Wasp, and *Gonipterus scutellatus* or the Eucalyptus Snout Beetle. Ironically, *Leptocybe* is the most recent insect invader to reach our shores, and *Gonipterus* was one of the first. This illustrates the fact that once the non-native pests have arrived in South Africa. They are here for good, so the best we can do is to control their populations going forward.

*Leptocybe* is a native Australian wasp that lays its eggs in the mid-ribs and petioles of leaves on a wide range of Eucalyptus species, creating galls or 'lumps' that severely stunt growth and can cause tree death in extreme cases.

In Australia, these wasps are not a major problem because the populations are kept in check by natural enemies, which have evolved over eons. But outside of the home range, it's another story. They have no natural enemies, so when they come across some juicy young *Eucalyptus* trees that are to their

liking, they flourish, and then you have a population explosion.

This tiny wasp showed up in the Middle East in 2000, and caused major damage. It then started spreading down the east coast of Africa, and first showed up in South Africa in 2007 where it was



Galls on young Eucalyptus trees in Zululand a sure sign of *Leptocybe* infestation.



*Gonipterus*, and the characteristic scalloped leaf margins.

encountered in Pretoria. It is now spreading rapidly through *Eucalyptus* plantations in Zululand and the Midlands, and will soon be present in all *Eucalyptus* growing areas in southern Africa.

### Eucalyptus Snout Beetle

The Eucalyptus Snout Beetle is another Australian native that has been in South Africa for almost a century. The beetles feed on the leaves, giving them a characteristic scalloped appearance. Recent resurgence of the beetle in South African plantations has raised concerns that a parasitic wasp, which was introduced into South Africa as a bio-control agent way back in the 1920s, is not as effective as it was in the past. This may be due to the fact that there could be more than one *Gonipterus scutellatus* species in South Africa, a recent discovery by the



*Eucalypt* infected with *Coniothyrium* canker.

TPCP, who have applied molecular biology tools to this question. The TPCP team is monitoring this pest closely to plan a way forward.

Our first stop on this field trip was a compartment of young Eucalypts, one of the popular G x C hybrids growing in Zululand just outside Kwambonambi. You could see from a distance that the new growth wasn't 100% healthy. On closer inspection, we found the telltale *Leptocybe* galls on the new growth on almost every tree in the compartment. Izette cut a longitudinal section through one of the galls, and showed me the small cavities inside the galls where larvae feed and pupate. On older galls, you can see the tiny wasp exit holes, about the size of a pin-prick. The wasp itself is the size of a pin-head, and has a sort of metallic blue shine. While the wasp is very difficult to see, you can't miss the galls.

The compartment alongside was planted with a different clone and had no evidence of *Leptocybe* whatsoever. So there is at least early evidence of host resistance.

Our next stop was an older compartment, but the story was the same – galls all over the new growth. While we were there, we also spotted the Snout Beetle. It's much larger than *Leptocybe*, just under a centimetre in length, and can do plenty of damage. We found numerous *Eucalyptus* Snout Beetles all over these trees, as well as their little black/brown egg casings stuck to the leaves.

Our next stop was a small compartment next to the Nseleni station where a pathetic sight greeted us. This, according to Izette, is the worst *Leptocybe* damage she has seen anywhere in the country. The trees are from a clone planted some years ago by HL & H. They are covered in galls and have very few leaves left, and are only just surviving. Another clone planted right next door is untouched. This illustrates the importance of planting pest-tolerant trees.

Since *Leptocybe* reached our shores, the large forestry companies and nurseries have been working closely with the ICFR and TPCP team to identify tolerant species. It's a complex process because there are different levels of tolerance within the same species, and the pest has only been around for a couple of years, so this work has a lot of ground to make up. There is also emerging evidence that clones tolerant to infestation by *Leptocybe* later show susceptibility. This is worrying and it sends out a warning signal that we need to understand that we are dealing with a complicated biological system here.

Meanwhile, the TPCP is busy testing a number of parasitoid wasps in the new bio-control facility at the University of Pretoria Research Farm. Apparently, bio-control of *Leptocybe* has been very successful in Israel, and so there are hopes that it will be effective in South Africa as well.

### *Coniothyrium* canker

We made one more stop to inspect a compartment of *Eucalyptus* clones that has been severely affected by *Coniothyrium canker*. It is a fungal pathogen that causes cankers on the green tissue of the stems. It penetrates the wood and affects stripability of the bark, and affects the growth and development of the tree. Genetic studies show that it could be from Asia. This was one of the first *E. grandis* clones to be planted in Zululand, but it is no longer being planted for obvious reasons. The compartment next door has no sign of infection.

This once again underlines the importance of keeping up to date with the latest pest and disease outbreaks, so that you can plant the best and most tolerant tree species available. It is a dynamic environment, nature is constantly evolving and pests and diseases are always on the move around the world, and so foresters need to be on their toes.

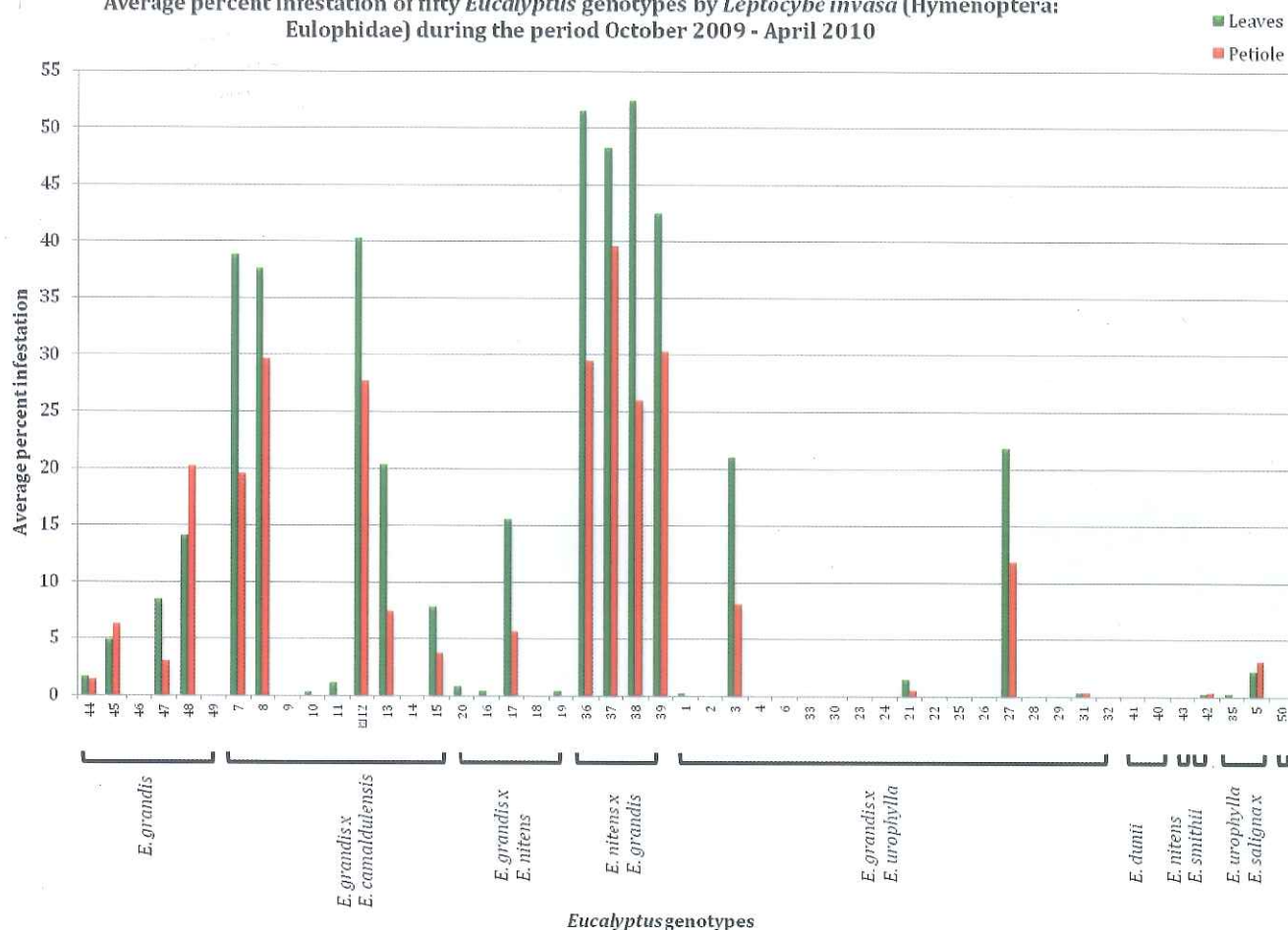
The research team of the TPCP is working actively to provide forest owners with management options for *L. invasa*. Host plant resistance is the best available option at present, and forest owners should attempt not to plant susceptible clones, or to coppice clones showing any sign of susceptibility. A 'decision tree' based on the latest information will be made available shortly. However, biological control offers the best possible long-term option to reduce damage due to *L. invasa*, and development of biological control agents is being actively pursued.

Information on *L. invasa* and *G. scutellatus*, as well as information on other pests and diseases, can be obtained on the TPCP website ([www.fabinet.up.ac.za](http://www.fabinet.up.ac.za)). Updates on TPCP work to reduce the impact of these pests will be sent out via the TreeHealthNet listserv. ■

### For more information, contact:

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Average percent infestation of fifty *Eucalyptus* genotypes by *Leptocybe invasa* (Hymenoptera: Eulophidae) during the period October 2009 - April 2010



## Host resistance trial results



The *Leptocybe invasa* wasp.

Host resistance is one of the main tactics for the management of the *Eucalyptus* gall wasp, *Leptocybe invasa*. The TPCP is involved in screening *Eucalyptus* genotypes to assess their susceptibility or resistance to gall formation by *L. invasa*. The first of these trials was completed in 2010 (see results). In total, 50 *Eucalyptus* genotypes from five *Eucalyptus* species and five *Eucalyptus* hybrids were screened. The GC540 clone (genotype 12) was used as a positive control as it was known to be highly susceptible to infestation by *L. invasa*. Results from the 2010 trial clearly show variation in susceptibility between species and hybrids, but importantly, also within some species and hybrids (see results for *E. grandis* and GC as examples). The TPCP is currently busy with another screening trial to test

different *Eucalyptus* genotypes, and will start a third trial later in 2011. The screening trials provide some indication of which genotypes are more susceptible and which are more resistant, but the results do need to be taken with caution, because:

- Small, potted plants are screened in the nursery, and further investigation is required to determine if the same patterns in susceptibility will persist with older trees.
- The trials are located in Pretoria and further investigation is required to determine if the same patterns of susceptibility will persist across localities.
- The trials are a choice experiment, but results may differ when *L. invasa* is 'forced' to infest one host.
- It is not known whether *L. invasa* will have the ability to adapt and overcome the resistance of certain clones. ■

### Contact details

For more information on these trials, or general information on *L. invasa*, please contact: Dr Brett Hurley. Phone: 012 420 5822. Email: [brett.hurley@fab.up.ac.za](mailto:brett.hurley@fab.up.ac.za)

## Don't jump to conclusions about *Leptocybe*

by Mike Wingfield

The *Leptocybe* situation is a complex one. People look for easy answers - I am worried about the fact that assumptions are being made regarding hybrids based on screening that has been done.

For example, one can find G x U very seriously damaged, and other clones of the same hybrid resistant. People tend to forget that hybrids are rather special - they can behave very differently to the parent species. Tests will need to be made on every individual clone.

Further, I am seeing some clear evidence of clones previously thought to be resistant, now being invaded. Also, I have seen a clone severely affected when young, growing quite well.

I saw a vivid example of this in Laos recently - a clone so heavily infested that the branches were hanging on the ground, now two years old and looking great.

I am not saying that we should be planting susceptible clones, but there is an awful lot we don't know about this pest and there is a danger in jumping to conclusions about what might lie ahead. ■