

Fumigation:
“What you don’t learn in the Classroom” (Waiting for the worms)

Pre-Amble:

The process of any fumigation is already one of some complexity, and encompasses attention to detail, and of course focus on safety (*both for yourself, and for the general public, and the environment*).

Accepting that we have applied due diligence to the task, we dutifully apply the fumigant, and allow the process to complete, and then supply the required paperwork etc., and allow the business of the day to continue.

For purposes of this script, the fumigation was successful, remained in-situ for the allotted period of time and was then successfully ventilated and cleared, and released into the customers’ hands.

The conditions and requirements of the fumigation having been met:.... And so to my working example.

The example:

We will use timber, and in this case “dunnage” in the form of pallets, and the fumigant is Methyl Bromide (Ch₃Br-100%), (*Which for purposes of this example is recognised as the most effective fumigant available for ISPM-15 (IPPC) at this time. This script does not serve to justify its existence or otherwise, nor its priority in the bigger scheme of things.*)

There are a number of factors that influence the total success of the fumigation, that are arguably out of our control right from the outset, and again for this example, the “condition” of the timber will be considered.

Most “dunnage” is constructed of sap-wood, (Softwood), and good old SA-Pine readily comes to mind.

Moisture content and the mechanical processes in preparing the timber, will determine the condition that the timber is in, when it gets fumigated, and part of the mechanical process is the de-barking of the timber, and of course the cutting and drying processes that are applied at source.

Insects and Fungi are taken care of by the fumigation, and in the case of Fungi, provided that the timber does not contain high levels of residual moisture, the fumigation process will effectively sterilise the Spore and all is well.

There lurks however other phenomena, which may or may not be present, and one of these (*in the case of Pine*), is a microscopic organism called ***Bursaphelenchus Xylophilus***, the ***pine-wood nematode***.

This is a parasitic organism, which infects the tree, (above ground), and is typically introduced to the tree by Beetle.

The parasite is small enough to enter the transmission Vector (*the Beetle*), through its breathing organs (*Spiracles*) and when the Beetle attacks the tree, these parasites then enter the timber. They are of economic importance because the tree will die within weeks or months of the parasite’s establishment.

A single beetle can carry as many as 90,000 nematodes in the respiratory tracts.

The nematode enters the resin canals in the tree, and quickly blocks the tree's feeding mechanism causing the leaves (*Needles*) to die, and thereby stopping the photosynthesis process. (*It's a lot more complex but serves to illustrate the point, and the end result is; the tree dies very quickly*).

And so back to our fumigation:

We are at the mercy of the condition of the timber and its moisture content. It is recognised that in spite of the high volatility of the Methyl Bromide (*and any other fumigant for that matter*), and its ability to penetrate pretty much everything, it runs into a natural barrier called moisture.

If the timbers are not properly processed and dried, there is a better than average chance of these organisms surviving the process and also surviving the fumigation as a result of the moisture barrier within the timber.

As with most "systemic" invaders, it is not practical to apply Insecticides or Nematicides to the outside of the timbers: "Systemic" implies that nutrients and intended remedies must be introduced through the root systems or introduced through the Stomata (*Breathing holes*) on the underside of the leaves. These interventions are difficult and with regard to the photosynthesis process, almost impossible (*unless you are a molecule of Carbon Dioxide, or Nitrogen and Oxygen*), which is exchanged by the leaves during this process.

The global context:

Fumigators will acknowledge that timbers in the form of dunnage, and structured packaging or boxes or even raw furniture etc., originate from all corners of the world.

Whether we have the specific species of Cerambicidae in this country or not, is a secondary consideration.

These Nematodes (*an animal*), and arguably others, both above and below ground, do exist and are found in Pine (*for this example*); they represent a tangible threat to pine forests all over the world, and we are tasked with understanding the impact and applying as much caution, advice and preventative measure as is reasonably possible.

We urge you to apply your mind and knowledge for the benefit of all concerned, lest we all fall foul of a small worm with a huge name: ***Bursaphelenchus Xylophilus***,



In the broader context of Export and Import, South Africa exhibits live flowers and plants and trees at various exhibitions around the world. Nematodes are potentially always present, and we are ever mindful of the responsibility associated.

Take care:

Colin