

Fumigant Comparison

In March 2008, Researchers at the Oregon State University – Utility Pole Research Cooperative (OSU-UPRC) initiated a field trial at their Corvallis, OR field test plot that included all three of Osmose’s methylisothiocyanate-based (*mitc*-based) fumigant technologies. This single large scale field test compared the performance characteristics of MITC-FUME®, WoodFume® and DuraFume® with a liquid copper accelerant under the same test conditions. Chemical movement in the penta-treated Douglas-fir test poles was assessed 18, 30, 42, 54 and 89 months after treatment (OSU-UPRC 35th Annual Report 2015). While this test is still ongoing, OSU Researchers have determined the following from the test results obtained to date:

- **MITC-FUME** treated poles contained the highest levels of *mitc* of any treatment 18 months after treatment, with levels approaching 100 times the fungitoxic threshold. Levels of *mitc* remained elevated through the 30, 42 and 54 month sampling periods, particularly in the groundline zone. Levels of *mitc* declined considerably in test poles from 54 to 89 months, but were still well above the threshold for protection against fungal attack.
- Poles treated with **DuraFume** plus a copper accelerant exhibited *mitc* levels that were 8 to 11 times the fungitoxic threshold 18 months after treatment. Levels of *mitc* steadily increased up to 42 months then declined 54 months after treatment. Overall *mitc* levels were still continuing to decline at 89 months but concentrations remained 3 to 6 times the threshold at many locations. When compared to MITC-FUME, the slower release of *mitc* may be due to the dependency of DuraFume on moisture to produce *mitc*.
- **WoodFume** treated poles contained *mitc* levels that were 3 to 5 times the fungitoxic threshold 18 months after treatment. These levels then declined steadily over the next 24 months but were still above threshold at the 42 month sampling. *Mitc* levels continued to decline and were all uniformly below the threshold 54 months after treatment. *Mitc* was virtually non-detectable in test poles after 89 months.

The data from this field trial clearly shows that MITC-FUME provided the greatest level of protection by generating the highest levels of *mitc* that traveled furthest from the point of application. The data also shows that although DuraFume initially releases less *mitc* than MITC-FUME, this technology is capable of delivering fungitoxic levels over extended periods of time where moisture levels are favorable. From these findings, OSU Researchers concluded the following after 89 months of field exposure:

- “.....results indicate that MITC-FUME would easily provide protection against renewed fungal attack for 10 years based upon the time required for fungi to begin reinvading fumigant treated poles.”
- “.....results are also consistent with previous field trials and indicate this system (DuraFume + 2% Cu solution) will provide at least the 10 year protective period used by most utilities in their inspection and treatment cycles.”

Below is a summary comparison of commercially available *mitc*-based fumigants:

- MITC-FUME is 97% *mitc* in a solid-melt form pre-packaged in individual tubes. At 97% *mitc*, it delivers the highest concentration of active ingredient to the pole, and since it doesn’t have to decompose to produce *mitc*, it provides quick control of decay.
- DuraFume is a solid granular/powder that contains 98% dazomet which decomposes within a utility pole in the presence of water to release *mitc*. Like liquid WoodFume, the conversion efficacy of dazomet-to-*mitc* is fairly inefficient at only 45% under ideal conditions. As a means to accelerate the decomposition to *mitc*, the EPA product labels for the dazomet fumigants recommend the addition of a copper solution at the site of fumigant application.
- WoodFume is a liquid formulation containing 33% metam-sodium that chemically decomposes in the pole to release *mitc*. The breakdown of metam-sodium is not complete, however, with a metam-sodium-to-*mitc* conversion efficacy of only 18%.
- EZ-FUME®, a newly released solid stick technology (EPA Reg. No. 75341-20) that contains 91.14% dazomet was not available for evaluation in the OSU-UPRC field study. Additional field studies that include the EZ-FUME technology are underway and performance data is available from Osmose.