# UPDATE ON EDN$^{TM}$ FOR POST HARVEST APPLICATION

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EDN (active ingredient -Ethanedinitrile $C_2N_2$) is a broad-spectrum fumigant, highly toxic to insects, nematodes and fungal pathogens of timber and logs. EDN is neither an ozone depleting substance nor is it a green-house gas. It is currently registered for use with-in Australia and is in the process of being registered in New Zealand. Scientific Research is underway in a number of countries to support the registration and phytosanitary approvals for the use of EDN. Supporting data has been submitted to the IPPC, to gain EDN approval under ISPM-28 for treatment of wood for insect pests.

EDN has a number of advantages for use as a forest product phytosanitary treatment. The boiling point of EDN is -21 ° C which allows it to be applied as a gas. It is efficacious at low temperatures. EDN is a smaller molecule with a high vapour pressure which allows it to achieve equilibrium quickly in a fumigation environment resulting in higher efficacy. EDN has potential as a phytosanitary alternative to methyl bromide for treatment of pallets, sawn timber and logs.

Research conducted by the New Zealand Institute for Plant & Food Research Limited (PFR) has shown that a treatment period of 24 hours is efficacious to all the life stages of three species of forest insect tested in New Zealand. In end point testing 1% of the product remained at the end of the treatment period at the highest proposed dose rate. This remaining gas can be quickly and safely ventilated into the atmosphere.

PFR has also found that no HCN is produced in the head space as a result of EDN during timber fumigation. AERMOD modelling using the maximum proposed dose rate and treatment time of 24 hours used meteorological data collected over 5 years to predict EDN emissions during treatment and ventilation. This modelling using Tauranga as the example has shown that a maximum of 5 ppm for 8 hours average could be found at 13 m from the edges of multiple stacks in the worst case situation. Laboratory testing, field studies and modelling findings show that EDN can be used as an alternative to methyl bromide without compromising worker and bystander safety.

Efficacy data generated by various researchers shows that EDN is toxic to insect pests belonging to Cerambycidae (Asian long horn beetle, *Anoplophora glabripennis;* Burnt pine long beetle *Arhopalus ferus*; European House Borer *Hylotrupes bajulus;* Japanese pine sawyer *Monochamus alternatus*); Curculionidae (Black pine bark beetle, *Hylastes ater;* Golden haired bark beetle *Hylurgus ligniperda; Pine shoot beetle Tomicus piniperda);* Rhinotermitidae (Subterranean Termite, *Coptotermes acinaciformis; Japanese termite, Reticulitermes speratus); Kalotermitidae (*Subterranean Termite *Cryptotemes brevis);* and, Mastotermitidae; (Giant Northern termite *Mastotermes darwiniensis).* Nematode: Parasitaphelenchidae (Pine wood nematode *Bursaphelenchus xylophilus);* Fungal pathogens, *(*Schizophyllaceae *(*Mushroom fungi, *Schizophyllum communz, and* Ganodermataceae (Wood decay fungi *Ganoderma applanaium).*

Further scientific research is being conducted or in the process in the USA, Canada, EU, Australia, New Zealand, India, Malaysia, South Korea and South Africa to gain

approval between trading partners, regulatory authorities and for the phytosanitary requirements.