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(147) Vacuum pressure impregnation for the elimination of the pinewood nematode from pine wood

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ABSTRACT

In order to evaluate the efficiency of the vacuum pressure impregnation with chemical preservatives in the elimination of the pinewood nematode (PWN) from wood, naturally PWN infected *Pinus pinaster* sections were introduced into a wood treating autoclave and exposed to the vacuum and pressure impregnation with the wood preservative TANALITH® E NB. After treatment, wood sections were removed and left at room temperature to dry and the total number of nematodes was quantified after incubation at 25°C for 15 and 30 days. No nematodes were detected in the treated wood sections after the incubation periods. These preliminary results revealed a potential use of this process to eliminate PWN from wood.

INTRODUCTION

The introduction of several invasive alien plant pests into non-native areas led to the development of appropriate phytosanitary measures against the introduction and spread of these species. Since wood material was recognized as one of the most important pathways for introductions of forest-related pests, the International Plant Protection Convention adopted the International Standard for Phytosanitary Measures No. 15, which serves as a guideline for the regulation of wood packaging material used in international trade (FAO 2009). The use of pinewood material for agricultural commodities and industrial items, has increased significantly as global trade has developed over recent decades. This has resulted in an increased risk of movement of non-native pest species on wood used in international transport. This is the case of the pinewood nematode (PWN), *Bursaphelenchus xylophilus*. In this study, we have evaluated the efficacy of vacuum pressure impregnation with chemical preservatives to eliminate PWN from wood.

MATERIALS AND METHODS

Pinewood nematode infected *Pinus pinaster* trees were felled and trunk sections were cut. Initial nematode population was estimated by cutting 5 cm segments of each end of the trunk sections. Nematodes were extracted using the tray method (Whitehead & Hemming 1965) and the total PWN number was estimated. Wood moisture content (WMC) was measured using a digital wood moisture meter. Trunk sections with less than 25 % WMC and containing more than 100 000 PWN (>60% third dispersal juvenile stage) (Magnusson & Schröder 2009) were selected and introduced into a wood treating autoclave and exposed to the vacuum and pressure impregnation with the wood preservative TANALITH® E NB plus the additive AC 3744 following the subsequent treatment scheme: i) initial vacuum with -950 mbar for 25 min; ii) autoclave filling with the preservative solution at 12500 mbar for 75 min; iii) emptying of the remaining solution to the autoclave support tank and iv) final vacuum to remove the excess preservative solution on the surface of the wood at -800 mbar for 8 min. After treatment, wood sections were removed and left at room temperature to dry and then, incubated at 25°C for 15 and 30 days to allow any live nematode present to breed and maximise the likelihood of detection (EPPO 2013). Nematodes extraction was performed by the tray method.

RESULTS

In the treated trunk sections, 100% nematode mortality was achieved in all post-treatment assessment incubation periods (15 and 30 days). These preliminary results revealed a potential use of this process to eliminate PWN from wood.

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