

AN OVERVIEW OF THE METHYL BROMIDE FUMIGATION
OF OAK LOGS INTENDED FOR EXPORT TO THE EEC.

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INTRODUCTION

Concern by member nations of the European Economic Community (EEC) over accidental introduction of the oak wilt fungus, Ceratocystis fagacearum (Bretz) Hunt has recently changed the requirements for export of logs from the USA to Europe. The system of certification based on log origin in oak wilt-free counties was no longer considered an adequate safeguard against accidental introduction of this pathogen. The requirements for logs to be free of bark and dried or heat treated prior to export were not practical to maintain log quality for the veneer industry.

A cooperative research effort demonstrated the feasibility of using methyl bromide (MB) at atmospheric pressure to eradicate the oak wilt fungus from logs at low temperatures, and, since January, 1986, properly certified fumigations have been accepted as adequate safeguard for exported logs to most EEC nations (1,14). Though there have been other interesting developments in the use of fumigants in wood products protection (3,15), this paper will focus on highlights of the oak log fumigation process and the current situation in the USA.

BODY

MB is currently widely-used (EPA-#464-3) to eradicate insect pests in a variety of commodities and has been the chemical of choice for eradication of pathogenic fungi from soil. Experimental work 20 years ago (4,8) indicated the oak wilt fungus could be killed in oak sapwood at atmospheric pressure with MB, but a more detailed study was needed to assure that lethal gas concentrations and duration of fumigations could be regulated to provide safe, practical, and effective commercial fumigation of large diameter oak logs at the cooler temperatures encountered during the export season.

Early laboratory work on fundamental aspects of MB penetration into oak sapwood demonstrated that concentrations needed to kill the oak wilt fungus could be achieved at low temperatures (6). Continued laboratory and preliminary field trials suggested that fumigation of infected oak at 240g MB/cubic meter of space under a 6 mil polyethylene tarp was effective for logs

and lumber down to 5C (10,12). By boosting gas level to 240g/cubic m 24 hr after fumigation began, the fungus was eradicated in red oak log sections consistently at 0C, but sporadic survival of the fungus occurred at -5C (11).

Finally, large scale outdoor fumigations of commercial oak logs were conducted in Indiana, USA to statistically validate fungus eradication at 5C and demonstrate practicality of the fumigation system (7). No adverse effects were noted in veneer made from these treated logs.

Based on the accumulated data from these cooperative trials (more than 20,000 isolations), a fumigation schedule (T312) was recommended by the USDA APHIS agency for issuing a Federal Phytosanitary Certificate for export logs (2,13). Normal tarpaulin fumigation procedures are used with the following special requirements:

a. A thermal conductivity (TC) instrument capable of reading at least 300 g/cubic meter.

b. Temperature (2" into logs) must be at 5C or above at the start of fumigation, and be maintained at not less than 3C during the 72 hr duration of the treatment.

c. The number of logs fumigated and the size of the enclosure is limited only by the ability to maintain an effective and safe fumigation (6-29,000 cubic feet enclosures are noted as having been used successfully).

d. Addition of MB after 24hr is required to regain the original 240g/cubic meter level to assure fungal eradication.

e. A 48hr post fumigation aeration is required for subsequent safe handling of fumigated logs (current TLV value is 5 ppm).

CONCLUSION AND COMMENT

The fumigation of oak logs from the USA has proved to be a suitable safeguard against accidental introduction of the oak wilt fungus into importing countries of the EEC. Careful and reliable monitoring of a specific treatment schedule must be maintained to continue safeguards against export of this potentially devastating pest.

Other points of current interest in the oak log exporting process include:

a. Some countries of the EEC will not accept veneer logs with bark even if certified as fumigated (UK, Greece, Portugal, Ireland, Spain).

b. White oaks (verified by the sodium nitrite reaction on heartwood) are exempt from fumigation if exported during the Oct 15 - April 30 period.

c. From Oct., 1987 through Aug. of 1988 oak logs were fumigated at 6 US ports (approx. 5600 logs in 537 containers and 32 bulk fumigations of approx. 7100 logs [5]).

d. A postfumigation test using tetrazolium chloride to detect death of oak parenchyma cells has been developed (9).

e. The EPA is considering the requirement of chloropicrin (2%) as a warning agent for MB fumigations. This teargas is noted by workers at 1ppm, but has been avoided in foodstuff and agricultural commodity fumigations due to its potential for lingering in organic materials. If required for log fumigation, it is unlikely to enter sapwood in significant amounts but may sorb into wet bark (J. Morrell, Oregon State Univ., personal communication). The possible difficulties of residue in shipping and handling logs remain to be tested.

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