FUNGI COLONIZING PEAT-VERMICULITE GROWING MEDIA - USDA FOREST SERVICE NURSERY, COEUR D'ALENE, IDAHO

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Container seedling production in forest nurseries may be seriously impacted by root diseases caused by pathogenic fungi. One potential source of these fungi is the peat-vermiculite growing medium commonly used to produce seedlings (James 1985). In most cases, pre-mixed growing media is not sterilized prior to use. However, some manufacturers will steam treat their mixes. Steam treatment is unlike chemical fumigation because beneficial microorganisms that can tolerate high temperatures are not killed, whereas most plant pathogenic fungi are eliminated (Baker 1957). Several of these beneficial microorganisms are spore-forming bacteria which may be antagonistic toward different plant pathogenic fungi (Broadbent and Baker 1975; Cook and Rovira 1976; Louvet and others 1981).

The USDA Forest Service Nursery in Coeur d'Alene, Idaho recently received steam-treated peat-vermiculite growing media from Weyerhaeuser Corporation to be used in production of container-grown conifer seedlings. Samples of the media were analyzed for presence of fungi, especially potential plant pathogens which may cause seedling diseases.

Five samples of peat-vermiculite media were collected from different locations in one bag. The samples were individually ground to a fine powder with a mortar and pestle and sieved through one layer of cheesecloth to remove larger fragments. Ground media was then lightly sprinkled on the surface of two types of agar: a selective medium for the isolation of *Fusarium* and other closely related pathogens (Komada 1975), and standard potato dextrose agar (PDA) which is non-selective and allows most fungi to grow. Slow growing fungi are often overgrown by more rapid growing types on PDA. Agar plates were incubated for 5 days at about 24°C under diurnal cycles of cool, fluorescent light. Emerging fungi were transferred to PDA slants and identified to genus using a standard taxonomic guide (Barnett and Hunter 1972).

All media samples were extensively colonized by fungi in the genera *Trichoderma* and *Penicillium*. *Trichoderma* was isolated from samples on both Komada's medium and PDA. *Penicillium* was only isolated on PDA; this inability to grow on Komada's medium is due to the selective nature of the medium. *Phoma* sp. was isolated from one of the samples on PDA. No other fungi, including potential plant pathogens such as *Fusarium*, were isolated from the growing media.

Trichoderma and *Penicillium* are common colonizers of peat-vermiculite growing media (James 1985, 1989). Both groups of fungi are usually saprophytic organisms growing on organic substrates. However, species of *Trichoderma* may also be important antagonists of pathogenic fungi (Papavizas 1985). Therefore, their presence in growing media is desirable in order to suppress development of pathogens if the latter are introduced on seed or containers (James 1987; James and others 1988).

Phoma spp. are capable of causing conifer seedling diseases, although they are usually not very aggressive pathogens (James and Hamm 1985). More commonly, they are saprobes that are common colonizers of containers (such as the Leach® pine cells used at the Coeur d'Alene Nursery) (James and Gilligan 1988). These fungi have not commonly been implicated in diseases of container-grown seedlings (James 1984).

It is interesting that steam treatment of the growing media sampled did not greatly affect the mycofloral composition. The organisms found in this treated media were very similar to those previously found in media not steam treated (James 1989). Populations may have been altered by the treatment; comparative quantitative differences between treated and untreated media were not determined.

From this evaluation, it is apparent that the peat-vermiculite media produced by Weyerhaueser is probably free of fungi that are potentially pathogenic to conifer seedlings. The media contained fairly high levels of *Trichoderma*, which are beneficial. Therefore, this media should be suitable for production of container-grown seedlings at the Coeur d'Alene Nursery.

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