



## Plant Health Care Inc.

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# Technical Bulletin

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### Cold Temperatures and *Pisolithus tinctorius*

There have been questions from potential customers about the cold tolerance of our inoculants of *Pisolithus tinctorius* (Pt). The question arose logically because most of the research done on this fungus was published by Southern U.S. scientists. However, in addition to the Southern USA, the ectomycorrhizal fungus Pt has been used in operational inoculations in the North. There, Pt was found to successfully form ectomycorrhizae and persist on roots of trees in extremely cold environments throughout the Eastern USA (Connecticut, Kentucky, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Ohio, Virginia, and West Virginia), high elevations in the Western USA (Colorado, Montana, Utah, and Wyoming) and in the Pacific Northwestern USA (Oregon and Washington). It has also been used successfully on trees in other cold climates, such as Canada, the Czech Republic, Germany, Hungary, Poland and Sweden.

This fungus has been found fruiting (puffballs) in many natural and man-made environments, and has been deposited in various University herbaria, in the states of Colorado, Connecticut, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Michigan, New York, New Jersey, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Utah, Virginia, Washington, West Virginia, and Wisconsin. It has been found, and is also deposited in University herbaria, in Austria, Canada, Finland, Germany, Hungary, Italy, and Russia.

In Southern nursery tests, Pt was found to survive soil winter temperatures as low as 20<sup>0</sup>F for several weeks without a tree host present, and the fungus retained its ability to form ectomycorrhizae on pine the following spring. On mined land reclamation sites, Pt ectomycorrhizae and its puffballs persist in soils frozen throughout much of the winter in Colorado, Pennsylvania, Ohio, Virginia, West Virginia, and Utah. Some of the winter temperatures in Colorado and Utah get as low as -15 to -25<sup>0</sup> F. Researchers in Maine and in Thunder Bay, Ontario, Canada inoculated seedlings of various species of spruce and jack pine with Pt and found that after outplanting from the nursery the Pt ectomycorrhizae persisted on the

seedling roots for several winters and improved survival and growth of the seedlings.

This fungus occurs naturally in urban, orchard, and forest environments, as well as on adverse sites, such as severely eroded soils and strip-mined coal and kaolin spoils. In addition to its occurrences in colder climates, Pt also occurs naturally on trees in warmer climates like those in the Southern and Southwestern USA, and in the warmer regions of Europe, Africa, Asia, Australia and New Zealand. It is also prevalent in Central and South America. Pt has a worldwide geographic distribution and occurs naturally on roots of hundreds of tree species.

### References

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