

## Environmental & Social Risk Assessment (ESRA)

Product name: Rotstop®C

CAS number: #: 112926-00-8

Active ingredient: *Phlebiopsis gigantea* strain VRA 1992

Manufacturer: BioForest

### Introduction

Heterobasidion root disease (HRD) causes growth loss, root and butt rot, and mortality of conifers. In Wisconsin, it is caused by the fungus, *Heterobasidion irregulare*. Infection often occurs after fungal spores released from conks land on fresh wounds or fresh cut stumps. RotstopC is one of the two pesticides that are registered in Wisconsin and legal for treatment of stumps to prevent HRD. It is a biological fungicide that contains spores and hyphae of the naturally occurring wood decay fungus, *Phlebiopsis gigantea*. The fungus competes against *Heterobasidion* spp. when applied directly to freshly cut stumps. RotstopC was registered by the EPA in 2016.

This stump treatment practice has been implemented on public and private lands in Wisconsin for over a decade, and recently in-depth environmental assessment documents were published for the use of the pesticide on federal lands in Wisconsin and Michigan (USDA 2012, USDA 2017). Many of the contents and conclusions from the federal environmental analysis documents, as well as a document published by Health Canada Pest Management Regulatory Agency (Health Canada, 2014) to grant the sale and use of RotstopC in Canada, are adopted in this ESRA.

### Assessment Considerations

#### 1. What are the human health risks (applicator and the public)?

No adverse effects from *P. gigantea* strain VRA 1992 were reported in the published scientific literature. When a *P. gigantea* strain VRA 1992 was administered orally to rats, no signs of toxicity or disease were observed, and no metabolites of toxicological significance were produced by the *P. gigantea* tested. The likelihood of residues contaminating drinking water supplies is negligible to non-existent. Dietary risks are minimal to non-existent.

The label states that it is harmful if swallowed, if absorbed by skin, or if inhaled. It causes moderate eye irritation. The product dust may be irritating to the respiratory system. Microbes may have the potential to provoke allergic reactions. No adverse effects are observed when used according to the instructions. Bystander exposure is expected to be much less than that of handlers and mixer/loaders and is considered negligible and not of concern.

#### 2. What are the potential negative environmental impacts and risks?

*P. gigantea* is a naturally occurring, ubiquitous saprophytic fungus in the forest environment and spores are commonly found in the air and on exposed surfaces.

Information available in the published literature on the environmental fate of *P. gigantea* strain VRA 1992 suggests that, as a saprophytic fungus, the organism will establish itself well in stumps and dead wood but rarely in standing trees. Survival of *P. gigantea* strain VRA 1992 in soil is limited and populations of *P. gigantea* strain VRA 1992 in soil should return to naturally occurring levels over time.

Health Canada waived toxicity testing on avian species, wild mammals, arthropods, non-arthropod invertebrates as well as for freshwater fish, aquatic arthropods, and aquatic plants due to the ubiquitous nature of *P. gigantea* in the forest environment and that the level of *P. gigantea* in the terrestrial and aquatic environment will not significantly increase as a result of the use of Rotstop C as a stump treatment during forestry timber harvesting. The toxicity profile of *P. gigantea* strain VRA 1992 based on laboratory animal studies also demonstrated a lack of toxicity, and a review of published literature indicated no reports of adverse effects to these terrestrial organisms, as well as a lack of adverse effects to aquatic organisms from natural populations of *P. gigantea*. A toxicity study has also shown that *P. gigantea* is not toxic or pathogenic to honeybees. Forestry products containing other strains of *P. gigantea* have been used in Europe for decades with no reports of adverse effects to animals.

*P. gigantea* has demonstrated a limited ability to infect living trees and does not cause adverse effects to other forest-dwelling plants. Published literature has shown that certain types of fungi and terrestrial insects dwelling within the stumps that will be treated with RotstopC may be temporarily affected but microbial and insect populations are expected to gradually re-establish as the natural degradation processes take place in the treated stump.

3. How effective is the proposed pesticide for the proposed target(s)?

When RotstopC solution is applied on the stump surface, *P. gigantea* colonizes the stump surface and outcompetes the *H. irregulare*, preventing it from becoming established or spreading. Artificial inoculation of pine stumps with *P. gigantea* showed a significant decrease in the presence of the pathogen in England (Tubby et al. 2008), in southern United States (Hodges 1964) and in Canada (Dumas and Laflamme 2013).

A research field study to evaluate the effectiveness of Cellu-Treat and RotstopC using natural inoculum is in progress in Michigan and Wisconsin.

4. What is the specificity of the proposed pesticide to the proposed target(s)?

*P. gigantea* is a natural fungus commonly occurring in coniferous forests, and specifically adapted to living in moribund wood. Survival of *P. gigantea* in soil is limited, and it does not cause adverse effects to “forest dwelling plants”, or to native populations of *P. gigantea*.

5. Is there a need for a maximum application site frequency and/or area other than specified on the product label?

*P. gigantea* is a naturally occurring, ubiquitous saprophytic fungus in the forest environment and spores are commonly found in the air and on exposed surfaces. Since *P. gigantea* has no direct or indirect effects on forest dwelling plants or native *P. gigantea* populations, no cumulative effects on soils or environment are expected overtime.

6. Is there another pesticide and/or Integrated Pest Management (IPM) technique that should be considered in lieu of the proposed pesticide?

Cellu-Treat is another pesticide that is registered and available in Wisconsin for the same purpose. Cellu-Treat is a borax-based fungicide (active ingredient: disodium octaborate tetrahydrate). GHS Classification of this product is Category 2 for Reproductive toxicity, and signal word: "Warning!" is used. There are numerous peer-reviewed papers that demonstrated the effectiveness of disodium octaborate tetrahydrate on fresh cut stumps in North America and Europe. A field study to evaluate its efficacy with natural inoculum in the Lake States is being evaluated.

Due to limited viable spore availability of *H. irregulare* under cold temperatures, the risk is low when harvesting occurs during winter (December through March). Planting at wide spacing can delay and reduce the number of thinnings.

7. Other Considerations

The product should be used in accordance with label directions, including necessary PPE (Personal Protective Equipment) to minimize human health risks and negative environmental impact. The current label states that applicators and other handlers must wear long-sleeved shirt and long pants, shoes plus socks, waterproof gloves, and protective eyewear such as goggles, face shields, or safety glasses. Entry into treated areas during the restricted-entry interval of 4 hours is prohibited.

Relevant Literature:

Dumas M.T. and Laflamme G. 2013. Efficacy of two *Phlebiopsis gigantea* formulations in preventing *Heterobasidion irregulare* colonization of red pine stumps in eastern Canada. *Phytoprotection*. 93(1): 25-31.

Health Canada Pest Management Regulatory Agency. 2014. *Phlebiopsis gigantea* strain VRA 1992. Ottawa, Ontario 53p.: Proposed registration document PRD2014-02. Cat. No. H113-23/2014-2E.

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Hodges, C.S. 1964. The effect of competition by *Peniophora gigantea* on the growth of *Fomes annosus* in stumps and roots. *Phytopathology* 54: 623

Tubby K.V., Scott D., and Webber J.F. 2008. Relationship between stump treatment coverage using the biological control product PG suspension, and control of *Heterobasidion annosum* on Corsican pine, *Pinus nigra* ssp *laricio*. *Forest Pathology*. 38(1): 37-46.

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USDA 2012. Environmental Assessment: 2012 Heterobasidion Root Disease Control. Chequamegon-Nicolet National Forest. 16pp.  
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USDA 2017. Environmental Assessment: 2017 Heterobasidion Root Disease Control. Huron-Manistee National Forest. 64pp.  
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Label: <http://www.bioforest.ca/UploadedFiles/files/US%20-%20RS%20Label%20Specimen%2008-26-16.pdf>

SDS: [http://www.bioforest.ca/UploadedFiles/files/Rotstop%20C%20SDS%20-%20v2\\_1%20-%20Sept%201%202016\(1\).pdf](http://www.bioforest.ca/UploadedFiles/files/Rotstop%20C%20SDS%20-%20v2_1%20-%20Sept%201%202016(1).pdf)

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