



Evaluation Report for Category B, Subcategory 3.2, 3.11, 3.12 Application

Application Number: 2014-1498
Application: New to Product Labels-New Pests
New to Product Labels-New Site or Host
New to Product Labels-Application Timing
Product: MustGrow Crop Biofumigant
Registration Number: 30263
Active ingredients (a.i.): Oriental mustard seed meal
PMRA Document Number : 2439801

Purpose of Application

The purpose of this application was to expand the currently registered label for MustGrow Crop Biofumigant to include pre-plant treatment for various new crops to suppress certain soil-borne diseases and nematodes.

Chemistry Assessment

A chemistry assessment was not required for this application.

Health Assessments

No changes were made to the formulation of MustGrow Crop Biofumigant, therefore no toxicology information was required or provided for this application.

The changes to the directions for use are not expected to significantly change exposure to workers during loading and application of the product to the soil or during post-application activities, and no changes to the requirements for personal protective equipment or the restricted-entry interval were proposed. Similarly, the changes are not expected to result in a change in exposure to bystanders.

The applicant submitted several published studies which confirm the rapid degradation of both allyl isothiocyanate and glucosinolate in the soil environment, which was discussed in the initial review of Oriental mustard seed meal. It is expected that the levels of glucosinolate and allyl isothiocyanate in the soil at 14 days post application will be negligible and not of concern; therefore the requested changes are not expected to result in dietary concerns.

Maximum Residue Limit

As levels of technical grade active ingredient (TGAI) in the soil at the time of planting or seeding (14 days after end-use product application) are expected to be negligible, residues are not expected to be present on the crops and it remains unnecessary to specify a maximum residue

limit (MRL) for Oriental mustard seed meal. Similarly, due to rapid degradation of Oriental mustard seed meal in the environment, the presence of the TGAI in drinking water is also expected to be negligible.

Environmental Assessment

The new uses and label changes for the product MustGrow Crop Biofumigant do not cause any change in environmental exposure from that of the currently registered product. Therefore, the amendments will not pose additional risk from an environmental point of view.

Value Assessment

Efficacy data from a total of 21 trials were submitted to support the claims of suppression of certain nematodes. MustGrow Crop Biofumigant was applied in fall in bareground trials, and in early spring when tested in the in-crop trials. Overall, MustGrow Crop Biofumigant reduced nematode counts, compared to the non-treated control at both the low and high rates of 1121 kg/ha and 2242 kg/ha. The reductions of nematode counts varied from 50% to 85% when MustGrow Crop Biofumigant was applied at the high rate, depending on the trial location and species of nematodes. However, the low rate did not demonstrate a sufficient level of suppression on soybean cyst nematode to be supported.

Efficacy data from a total of 32 trials were submitted to support the claims of suppression of certain soil-borne pathogens, including *Fusarium* spp., *Pythium* spp., *Phytophthora capsici* and/or *Verticillium*. The data provided for all soil-borne pathogens consisted of pathogen counts (colony-forming unit) on the selective medium associated with the individual pathogen. Supporting evidence of direct disease assessment (disease incidence or severity) was only evaluated for verticillium wilt. MustGrow Crop Biofumigant at the rates of 1121 kg/ha and 2242 kg/ha reduced the pathogen populations in most trials compared to the non-treated control. MustGrow Crop Biofumigant at the high rate generally reduced number of pathogens counts by 40 – 60% in most trials. Slightly less reduction was observed when applied at the low rate. Because the pathogen counts, especially for *Pythium* and *Fusarium*, are not necessarily correlated with disease development on the relevant host crops, these counts cannot be accepted as direct disease assessments. Claims of suppression of pathogen populations in the soil are supported based on the pathogen counts provided. In addition, the low rate did not demonstrate a sufficient level of suppression on *Fusarium* spp., *Pythium* spp., and *Phytophthora capsici* to be supported.

The availability of MustGrow Crop Biofumigant for use as a pre-plant soil treatment will provide Canadian growers an additional option to suppress certain nematodes and soil-borne fungal pathogens on various crops. MustGrow Crop Biofumigant is the first naturally derived soil treatment against both soil nematodes and soil-borne fungal pathogens in Canada. Registering these new uses provide growers of both conventional and organic crops with a lower risk, resistance management tool against soil-borne pathogens and nematodes.

Conclusion

The Pest Management Regulatory Agency has completed an assessment of the information

provided in support of the product MustGrow Crop Biofumigant, and has found the information sufficient to include pre-plant treatment for various new crops to suppress certain soil-borne diseases and nematodes to the product label.

References

PMRA Document Number	Reference
2421724	2012, Use Description/Scenario (Application and Post Application), DACO 5.2.
2421722	2012, Waiver for the Requirement of Residue Data for MPT MustGrow Crop Biofumigant, DACO: 7.1, 7.4.1.
2421721	2012, Tier II Environmental Fate Testing: Soil Stability Satisfaction of Data Requirement with Literature/Rationale, DACO: 7.1
2421731	2014, Efficacy and Crop Tolerance Summary for MPT MUSTGROW CROP BIOFUMIGANT as a Preplant Soil Treatment for Certain Soil-Borne Diseases and Nematodes in All Crops, DACO: 10.1, 10.2.1, 10.2.2, 10.2.3.2(D), 10.2.3.3(D), 10.3.1,10.3.2(B), 10.5, 10.5.1, 10.5.3, 10.5.
2421733	2013, Test the Efficacy of MustGro at Various Rates for the Control of Soil Diseases and Nematodes, DACO: 10.2.3.3(D)
2421735	2013, Test the Efficacy of MustGro at Various Rates for the Control of Soil Diseases and Nematodes , DACO: 10.2.3.3(D)
2421736	2011, Efficacy of MustGro for Control of Soil Disease and Nematodes, DACO: 10.2.3.3(D)
2421737	2011, Efficacy of MustGro for Control of Soil Disease and Nematodes in Five Points, DACO: 10.2.3.3(D)
2421738	2012, Efficacy of MustGrow for Control of Nematodes and Soil Disease in Tomato, DACO: 10.2.3.3(D)
2421742	2011, Efficacy of MustGro for Control of Soil Disease and Nematodes in San Diego, DACO: 10.2.3.3(D)
2421744	2011, Efficacy of MustGro for Control of Soil Disease and Nematodes in Santa Maria, DACO: 10.2.3.3(D)
2421745	2011, Efficacy of MustGro for Control of Soil Disease and Nematodes in Oxnard, DACO: 10.2.3.3(D)
2421746	2011, Efficacy of MustGrow for Control of Nematodes, Weeds, and Soil Disease in Strawberry, DACO: 10.2.3.3(D)
2421748	2011, Efficacy of MustGro for Control of Soilborne Diseases in Tomato, DACO: 10.2.3.3(D)
2421749	2011, Efficacy of MustGrow for Control of Nematodes, Weeds, and Soil Disease in Strawberry, DACO: 10.2.3.3(D)
2421750	2011, Efficacy of MustGro for Control of Soilborne Diseases in Tomato, DACO: 10.2.3.3(D)
2421752	2012, MPT1201 Crop Safety Cantaloupe, DACO: 10.3.2(B)
2421753	2012, MPT1201 Crop Safety Carrot, DACO: 10.3.2(B)
2421755	2012, MPT1201 Crop Safety Cucumber, DACO: 10.3.2(B)

- 2421756 2012, MPT1201 Crop Safety Lettuce, Green Leaf, DACO: 10.3.2(B)
- 2421757 2012, MPT1201 Crop Safety Lettuce, Head, DACO: 10.3.2(B)
- 2421758 2012, MPT1201 Crop Safety Lettuce, Red Leaf, DACO: 10.3.2(B)
- 2421760 2012, MPT1201 Crop Safety Lettuce, Romaine, DACO: 10.3.2(B)
- 2421761 2012, MPT1201 Crop Safety Pepper, Bell, DACO: 10.3.2(B)
- 2421762 2012, MPT1201 Crop Safety Squash, DACO: 10.3.2(B)
- 2421763 2012, MPT1202 Crop Safety Cantaloupe, DACO: 10.3.2(B)
- 2421764 2012, MPT1202 Crop Safety Carrot, DACO: 10.3.2(B)
- 2421766 2012, MPT1202 Crop Safety Cucumber, DACO: 10.3.2(B)
- 2421767 2012, MPT1202 Crop Safety Lettuce, Greenleaf, DACO: 10.3.2(B)
- 2421768 2012, MPT1202 Crop Safety Lettuce, Head, DACO: 10.3.2(B)
- 2421769 2012, MPT1202 Crop Safety Lettuce, Redleaf, DACO: 10.3.2(B)
- 2421770 2012, MPT1202 Crop Safety Lettuce, Romaine, DACO: 10.3.2(B)
- 2421771 2012, MPT1202 Crop Safety Pepper, Bell, DACO: 10.3.2(B)
- 2421772 2012, MPT1202 Crop Safety Squash, DACO: 10.3.2(B)
- 2421774 2013, APPLICATION OF MUSTGRO TO CONTROL VERTICILLIUM DAHLIAE WILT IN STRAWBERRIES , DACO: 10.2.3.3(D)
- 2421725 Borek V, Morra MJ, Brown PD, McCaffrey JP, 1995, Transformation of the Glucosinolate-Derived Allelochemicals Allyl Isothiocyanate and Allylnitrile in Soil. *J. Agric. Food Chem.* 43, 1935-1 940, DACO: 7.1
- 2421726 Gimsing AL, Kirkegaard JA., 2006, Glucosinolate and isothiocyanate concentration in soil following incorporation of Brassica biofumigants, *Soil Biology & Biochemistry* 38, 2255–2264, DACO: 7.1
- 2421728 Gimsing AL, Kirkegaard JA., 2008, Glucosinolates and biofumigation: fate of glucosinolates and their hydrolysis products in soil, *Phytochem Rev* 8:299–310, DACO: 7.1

ISSN: 1911-8082

© Her Majesty the Queen in Right of Canada, represented by the Minister of Public Works and Government Services Canada 2015

All rights reserved. No part of this information (publication or product) may be reproduced or transmitted in any form or by any means, electronic, mechanical photocopying, recording or otherwise, or stored in a retrieval system, without prior written permission of the Minister of Public Works and Government Services Canada, Ottawa, Ontario K1A 0S5.