

1. Content of the 'Topic Description' document

1.1. Topic area

Management of pest/vector

1.2. Links to the Euphresco Strategic Research Agenda

The topic addresses the following objective(s) of the 2017-2022 Euphresco Strategic

- Objective 2017-R-3.1: to identify and evaluate (horizontal) risk reduction options (effectiveness, feasibility and cost)
- Objective 2017-R-7.1: to validate cost-effective and socially acceptable phytosanitary measures for consignments (pre-border and at border)
- Objective 2017-R-7.2: to validate cost-effective and socially acceptable phytosanitary measures at the place of production (inland) for plants, plant products, water and soil

1.3. Topic title

Development of validated procedures and data for phytosanitary treatment of wood products, such as wood chips and bamboo using ethane dinitrile

1.4. Description of the problem the research should solve

The development and approval of alternative phytosanitary treatments to banned molecules such as methyl bromide is a high priority to various countries. Although heat treatment is the second most used and internationally recognized phytosanitary treatment, its use on some commodities presents significant challenges. Ethane dinitrile (EDN) is a promising alternative to methyl bromide which has been evaluated worldwide.

There is a surplus of wood chips in Canada and ongoing interest in the EU and other countries worldwide to import wood chips from North America or other destinations, however, no feasible and economical phytosanitary treatment for wood chips is recognised. Alternative phytosanitary treatments are also needed for bamboo. While there has been sufficient efficacy data for EDN registration in some countries, more data is required for application for international acceptance in trade and approval under the IPPC as an ISPM 28 standard. The manufacturer has supported much research, but more is needed. The project will aim to validate the use of EDN as a phytosanitary treatment for wood chips and bamboo and generate data that could facilitate the acceptance of EDN by the European Union and trading partners as a phytosanitary treatment for wood chips.

1.5. Description of the expected results

The project will generate data that could facilitate the acceptance of EDN acceptance as a treatment used in international trade for other wood products, thus reducing the use of methyl bromide for quarantine and pre-shipment (QPS) uses.

1.6. Beneficiaries of this research product

National Plant Protection Organizations (NPPOs) would benefit from alternatives to methyl bromide for quarantine purposes and therefore the international acceptance of EDN as an alternative treatment option would be highly beneficial. Exporters and importers of wood products would also benefit from the acceptance of EDN as this would allow for new market access and business opportunities.

1.7. Research funders and research contribution/ distribution



| Funding organisation | Research activity and researchers involved |
|---|---|
| 1. Canadian Food Inspection Agency, Canada Brittany Day brittany.day@inspection.gc.ca | -Project coordination; Contact person: Mireille Marcotte E.mail address: mireille.marcotte@inspection.gc.ca ; |
| 2. Canada Wood, Canada Adnan Uzunovic adomu123@gmail.com | -Project coordination; Contact person: Adnan Uzunovic E.mail address: adomu123@gmail.com |
| 3. Australian Government Department of Agriculture, Fisheries and Forestry Keira Beattie PHSgovernancegroups@agriculture.gov.au | -Contribution to be detailed; Contact person: Alison Roach Email address: alison.roach@agriculture.gov.au Contact person: Farzad Jahromi Email address: farzad.jahromi@agriculture.gov.au |
| 4. Canadian Forest Service, Canada Meghan Noseworthy meghan.noseworthy@NRCan-RNCan.gc.ca | -Contribution to be detailed; Contact person: Meghan Noseworthy E.mail address: meghan.noseworthy@NRCan-RNCan.gc.ca |
| 5. Sitona AgroExpert, France Yann Ciesla yann.ciesla@gmail.com | -Contribution to be detailed; Contact person: Yann Ciesla E.mail address: yann.ciesla@gmail.com |
| 6. New Zealand Ministry for Primary Industries, New Zeland Aurélie Castinel Aurelie.Castinel@mpi.govt.nz | -Contribution to be detailed; Contact person: Ken Glassey E.mail address: Ken.Glassey@mpi.govt.nz |
| 7. Plant and Food Research, New Zealand Kambiz Esfandi kambiz.esfandi@plantandfood.co.nz | -Contribution to be detailed; Contact person: Kambiz Esfandi E.mail address: kambiz.esfandi@plantandfood.co.nz |
| 8. All Russian Plant Quarantine Center, Russian Federation Yuri Shneyder yury.shneyder@mail.ru | -Studies of EDN effectiveness for the treatment of pine logs against various pests. The list of pests may include <i>Monochamus</i> spp., <i>Bursaphelenchus xylophilus</i> and others; Contact person: Yakovlev Petr E.mail address: petro8710@gmail.com Contact person: Magomedov Ruslan E.mail address: magomedov_ruslan@vniikr.ru |
| 9. Animal and Plant Quarantine Agency, South Korea | -Contribution to be detailed; |



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|---|---|
| <p>Youngjin Park parky1127@korea.kr</p> | <p>Contact person: Young-mi Moon E.mail address: youngmi@korea.kr</p> <p>Contact person: Jun-ran Kim E.mail address: junrankim@korea.kr</p> <p>Contact person: Bong-su Kim E.mail address: bskim79@korea.kr</p> |
|---|---|

1.8. Research project partnership outside Euphresco

Euphresco funding ensures a certain level of transnational collaboration among Euphresco member countries. It is possible, if the funding consortium is interested, to contact funding organisations or research groups outside the geographical area covered by Euphresco members. The Euphresco coordinator could advertise the research topic in order to have an enlarged collaboration. If funders are interested in this possibility, please check the case below:

The funding consortium of the topic mentioned in section 1.2 requires that the topic is advertised outside the Euphresco network

1.9. Any other relevant information on content

Researchers in New Zealand have conducted a series of experimental work to support the registration of ethanedinitrile (EDN) as a phytosanitary treatment for export pine (*Pinus radiata*) logs. This work included: identification of the most tolerant species/life stage to EDN, of three species potentially associated with NZ export log species, determined the sorption/desorption characteristics of EDN when used to treat pine logs, measured concentrations of EDN during and after a commercial fumigation of pine logs with EDN, and identified and quantified the gases which remained in the treated space at the end of EDN fumigation (Najar-Rodriguez *et al.*, 2020¹). The results of this research has led to the recent decision (April 2022) to approve EDN application for timber and logs (pending worksafe approval) <https://www.epa.govt.nz/public-consultations/decided/decision-to-approve-edn/>.

In Canada a screening test was carried out using EDN as a candidate fumigant to replace methyl bromide for efficacy against a selection of forest pests, including the pinewood nematodes (*Bursaphelenchus xylophilus*) and four tree pathogens (Uzunovic *et al.*, 2021²). In these laboratory tests EDN has shown to be very efficient in killing nematodes and pathogens. This indicates that EDN could successfully eradicate pinewood nematodes in logs or wood chips over 24 h of less exposure time, however field studies are needed to confirm that.

Canada is planning to conduct research to support a general claim of EDN efficacy for 3 types of wood products (logs, lumber and wood chips). A minimum of two wood species representing different genera of conifers (e.g., pine and spruce) and of hardwoods (e.g., ash and maple) will be tested. Tests will be conducted using lodgepole pine and southern yellow pine infested with *Bursaphelenchus xylophilus*; similarly another conifer (most likely spruce) and two hardwoods that are naturally infested with bark and ambrosia beetles will be tested. Several tree pathogens (*Phytophthora ramorum*), *Ceratocystis fagacearum*, and *Heterobasidion annosum* will be added inside the piles of test wood before fumigation. The bamboo trial would need to follow a similar protocol to that of Barak *et al.*, 2009³.

¹ [Laboratory toxicity and large-scale commercial validation of the efficacy of ethanedinitrile, a potential alternative fumigant to methyl bromide, to disinfest New Zealand Pinus radiata export logs - ScienceDirect](#)

² <https://onlinelibrary.wiley.com/doi/abs/10.1111/efp.12723>

³ <https://academic.oup.com/jee/article/102/3/913/2199141>



Collaborators are welcomed to jointly discuss and further adjust test protocols especially to meet specific efficacy requirements to support acceptance of EDN efficacy data internationally, as well as to contribute by providing efficacy data on other wood commodities (such as bamboo), for other plant pests and/or to add replicates to the Canadian experiment (Canada would be pleased to share the experimental protocol for others to replicate the experiment).

2. Euphresco management aspects of the project

2.1 Indication of the topic budget

| Funding organisation | Mechanism | Total Budget |
|----------------------|-----------|--------------|
| 1. CFIA (CA) | In-kind | € |
| 2. CanadaWood (CA) | In kind | € |
| 3. DAFF (AU) | In kind | € |
| 4. CFS (CA) | In-kind | € |
| 5. Sitona (FR) | In-kind | € |
| 6. MPI (NZ) | In-kind | € |
| 7. B3 (NZ) | In-kind | € |
| 8. VNIKR (RU) | NC | € |
| 9. APQA (KR) | In-kind | € |
| | | |

2.2 Expected duration of the project (only for non-competitive topics)

The expected duration is approximately 24 months

2.3 Identification of project coordinator

Has the research project coordinator been identified?

Yes

No

2.4 Any other relevant information on topic organisation and management

None.