Date: December 2019

#	Products	Efficacy against Phytophthora	Tree resistance	Non target impact	Conclusion based on reviews	Category (Evidence based or No evidence)
1	Agrosustain	not effective	inconclusive	inconclusive	Lacks information. Nothing retrieved from the company/manufacturers website about the product. The company needs to consider submitting detailed information for further evaluation.	No evidence tentatively (Company may be protecting the products because of patency etc. as a result could not find this name on their website)
2	Anolyte Electrolyte Water (AEW)	potentially effective	no	yes	Further evaluation for phytotoxicity studies could be requested from the manufacturing company. This information from the company would assist in further review of the product since other forms of EW are considered toxic to the environment based on the review.	Evidence and research backed against other forms of phytophthora or soil borne pathogens. There are other types that pose danger to the environmental
3	Beer sludge	inconclusive	no	inconclusive	The views or thoughts on the ability of beer sludge to suppress or control kauri dieback disease is not documented. All documented information focused on the importance of beer sludge are mostly its use as a form of farm yard compost to improve or boost the performance of crops in terms of yield. For any report on the suppressive ability of beer sludge against plant pathogens to be convincing, research must take into consideration, quantifying heavy metal accumulation in the soil to ascertain its impact.	Evidence of use against other pathogens but not phytophthora spp. Also matters of concern to environmental pollution.
4	Biochar	potentially effective	inconclusive	inconclusive	Research backed. needs critical research with its application (e.g. Concentrations etc) for amending soil or growth medium	Evidence against Phytophthora
5	Biofil_Saniplant				Lack of information from company/manufacturer.	No evidence of use against phytophthora spp.
6	Biostim	no evidence	no	no	In order to further evaluate Biostim ORGENZ 2018 LTD should provide results of any tests of Biostim against plant pathogens. A full list of the active ingredients in Biostim is also needed.	No information or research proving Biostim could improve tree health and resistance
7	Chicken manure	potentially effective	inconclusive	yes	There are several reports that show chicken manure is effective against other species of Phytophthora. Previous research also indicates that chicken manure can improve seedling health and could be considered for trees in future	Although chicken manure and steam-pasteurized and powdered chicken manure compost could be considered for trials against P. agathidicida, there is some need for caution. This includes potential phytotoxic effects on kauri and possible negative effects on soil by increasing phosphorus levels.
8	Chitosan	potentially effective	inconclusive	yes	Research backed but needs critical research with its other mixed reports (i.e. environmental pollution etc).	Evidence against Phytophthora spp.
9	Chlorine Dioxide	not effective	no	no	There is no premise for the assertion that chlorine dioxide has the ability to control kauri dieback, as research has not established the potential of chlorine dioxide to suppress any form of *Phytophthora* spp.	Evidence based that it failed to control phytophthora capsici in water and phytophthora infestans in stored potatoes
10	Citrogrow	inconclusive	inconclusive	inconclusive	Lacks information on the manufacturers or company's' website.	No evidence of use against any plant pathogen
11	Colloidal Silver	potentially effective	inconclusive	inconclusive	Based on the findings pertaining to the use of colloidal silver (Nguyen et al. 2018), there is a need to test and verify whether successes recorded in the control of *P. capsici* , *P. nicotianae* and *P. colocasiae* with colloidal silver can be achieved against *P. agathidicida* in New Zealand. There have been other mixed results and some reports that have not published actual results. Studies are needed on the effect of colloidal silver against *P. agathidicida,* especially applications in field conditions, because there have been no field trials reported in any of the successful studies published to date.	Evidence against Phytophthora spp.
12	Copper	potentially effective	yes	yes	The mixed results on the use of copper require careful attention if its use against *Phytophthora agathidicida* is to be considered	Evidence although mixed reports
13	Cornmeal	inconclusive	inconclusive	inconclusive	The use of cornmeal in any form against kauri dieback is of low priority as there is no concrete evidence of any trials done with it on any form of pathogen.	No evidence
14	Des-o-germ SP Veg	inconclusive	inconclusive	inconclusive	Further information must be provided by the product manufacturer. Useful information would include research data showing the effect of the product on any form of oomycetes or specifically Phytophthora agathidicida. This information would need to be shared on a confidential basis between the company and stakeholders for further evaluation.	manufacturer states it could be used against phytophthora parasitica and cactorum
15	Des-o-start	inconclusive	inconclusive	inconclusive	Not research backed. Only manufacturer based information. We need to seek for more information if any exists	Nothing said about phytophthora
16	Essential Oils	potentially effective	yes	inconclusive	The use of essential oils against plant pathogens has been reported extensively, including *Phytophthora* spp. Although none of these reports include research focused on *P. agathidicida,* consideration could be me made for trialing/evaluation with such products. Most essential oils will differ in efficacy depending on the source of the extract, the dose applied and the climatic conditions. These factors should be taken into consideration if this field is to be further investigated.	Evidence against Phytophthora spp.
17	Geru and lime	potentially effective	inconclusive	inconclusive	No information was found on the use of geru against plant pathogens. There has been speculation about the importance of geru as paints (i.e. for painting) on trees, but this is not supported by any research. There is no foundation for their use against kauri dieback disease. There are different sources of lime and if specification is made from the inquirer much evaluation could be made for lime use against PA.	No evidence
18	GFS BioProtect Antimicrobial disinfectant spray and stimulant	inconclusive	inconclusive	inconclusive	There is no information regarding its use to treat any form of plant pathogen or disease. Company need to share results to authenticate the potential claims against plant diseases for further evaluation.	No evidence
19	HP18 Humate	inconclusive	inconclusive	inconclusive	Lack of information from company/manufacturer	No evidence
20	humble feijoa	inconclusive	inconclusive	inconclusive	As it stands now no research exist for feijoa use against PA, neither has it been used against plant pathogens. There is much to learn from its activity against the human-pathogenic candida research published if feijoa against PA is to be considered.	Nothing/lacks information: Misinformation and speculation
21	Irradiation, low current, low voltage	potentially effective	inconclusive	inconclusive	Most of the reports on the use of radiation were conducted under in vitro conditions and not in the natural environment. Considering the soil-borne nature of P. agathidicida, much work would be required to ascertain the validity of this method of control for kauri dieback disease. The use of low electrical voltage has not been demonstrated against any form of Phytophthora spp.	No evidence yet although research on other phytophthora spp. have been ongoing for over decades
22	Jeyes Fluid (product name)	inconclusive	inconclusive	inconclusive	The use of this product against kauri dieback should not be considered as there is no substantive evidence of any trials relating to disease control in plants. The disinfectant is reported to be harmful to plants based on the manufacturer's recommendations	No evidence
23	MycoGro Hort	potentially effective	yes	inconclusive	Although there is currently no research evidence to support the use of MycoGro Hort and MycoGro Soluble to control plant diseases in any form, it should perhaps be tested with reference to report number 181502, which notes that there are promising signs of mycorrhizae-based products having the ability to control or suppress plant diseases. It may be worth conducting both laboratory and field trials with products that are available in New Zealand.	No evidence against phytophthora spp.
24	MycoGro Soluble	potentially effective	yes	inconclusive	Although there is currently no research evidence to support the use of MycoGro Hort and MycoGro Soluble to control plant diseases in any form, it should perhaps be tested with reference to report number 181502, which notes that there are promising signs of mycorrhizae-based products having the ability to control or suppress plant diseases. It may be worth conducting both laboratory and field trials with products that are available in New Zealand.	No evidence against phytophthora spp.
25	Mycopesticide and mycoattractant	inconclusive	inconclusive	inconclusive	Several mycopesticide products have been reviewed in 2018 with respect to their importance in kauri dieback control. Most of these were highly specific in terms of their biological composition and have already been manufactured. However, in this case, the inquirer did not name any specific product. There are numerous mycopesticides and mycoattractants already on the market, although none have showed effects on Phytophthora agathidicida. The inquirer needs to be more specific in terms of a mycopesticide and/or mycoattractant product that has evident potential effect against any form of Phytophthora spp. There are challenges when trying to identify mycoattractants and mycopesticides, including host range and specificity, which demand time and resources to solve.	Evidence based but there are several mycopest/mycoatt and need to narrow down on that
26	Mycorrhizae	potentially effective	yes	inconclusive	Mycorrhizal fungi are promising biological control agents for further research on kauri dieback disease control in New Zealand. Mycorrhizal fungi should be considered for test in kauri trees against kauri dieback. Currently, the most efficient mycorrhizal fungi to use on particular host plants are largely unknown, hence much research should be considered to test different types of mycorrhiza fungi.	Evidence against Phytophthora spp.
27	NitroPhosca Blue	inconclusive	inconclusive	inconclusive	There are no research reports supporting the use of Nitrophoska Blue against plant pathogens, although it enhances the growth of plants.	No evidence/lacks information: speculation
28	Phosphate fertilizer	inconclusive	inconclusive	yes	Considering the potential environmental impact of phosphate fertilisers adding phosphate fertiliser to the soils where kauri trees are planted would demand prior knowledge of the existing level of phosphorus in the soil, to avoid excessive accumulation in the soil.	Evidence and backed by research
29	Potassium permanganate	potentially effective	inconclusive	yes	Considering the negative environmental impact, potassium permanganate should not be prioritised over other promising, less-hazardous methods of *P. agathidicida* control.	Evidence of use against phytophthora but negative environmental impact
30	Puresan Pro	inconclusive	inconclusive	yes	based on active ingredients in the products. Puresan has active ingredients that have been reported to be harmful to the environment. It is worth considering other promising products over Puresan.	More information needed from manufacturer.

31	Pythium oligandrum	potentially effective	yes	yes	Researched backed, Evaluation of other P. oligandrum strains should be considered because there are several strains of P. oligandrum.	Evidence against Phytophthora spp.
32	Sea weed extract	potentially effective	yes	inconclusive	Researched backed. Cross-disciplinary research could be considered to fully evaluate or explore the biological benefits of seaweed extracts and to elucidate their complex modes of action and potential applications in increasing kauri tree health and controlling P. agathidicida in New Zealand.	Evidence against Phytophthora spp.
33	Thyme extract	potentially effective	inconclusive	inconclusive	A search for plant extracts with broad, non-toxic antifungal action is necessary. At present, there is no research indicating that thyme has been used against Phytophthora agathidicida. Some plants may have antifungal properties but may not necessarily be able to eradicate or control a particular pathogen. Therefore, preliminary research needs to be conducted to determine the potential usefulness of thyme extract in treating kauri dieback disease in New Zealand.	Because it has antifungal properties, worth trying invitro trials if possibe.
34	Trichoderma	potentially effective	yes	inconclusive	Research backed. Follow-up could be done with regard to ongoing research in Auckland Botanical Gardens and Lincoln University via Dr. Robert Hill and Dr. Ivan Chirino-Valle, and the confidential sharing of the results with the appropriate groups. This would enable further evaluation for Trichoderma to be considered for trialing.	Evidence against Phytophthora
35	Zinc Oxide - rubber tyres	not effective	no	yes	Nothing to do with plant pathogens. The materials used for producing rubber tyres are also reported to have negative impact on the environment. Therefore, tyres are undesirable for application in the soil to control kauri dieback disease. Other options should be considered.	No evidence