



Sub-Group: Efficacy of Biological and Eco-Friendly CPAs (BIO)

Cancun, Mexico

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About the Sub-Group

To test and collect existing data for promising biological and eco-friendly control agents, compared with current control practices, in order to identify and propose suitable alternatives to conventional CPAs.





About the Sub-Group

- **Biological control** is a method of controlling pests (including insects, mites, weeds and plant diseases) using other living organisms. It relies on predation, parasitism, herbivory, or other natural mechanisms such as the use of pheromones.
- **Eco-friendly CPAs** are pesticides that are derived from plants or plant extracts and include CPAs such as garlic, ginger, neem and flowers such as marigold.

(include natural fertilizer preparations containing living microbial inoculants of bacteria, algae, plant growth promoting rhizobacteria (PGPRs), endo- and ecto-mycorrhizal fungi, cyanobacteria and other efficient micro-organisms)

- ✓ **Compliance to global requirements in CPA usage of paramount importance**
- ✓ **Focus on human and environmental impact of CPAs**
- ✓ **Increasing shortage of conventional CPAs due to withdrawals and bans**
- ✓ **Responsible and sustainable tobacco production**



1. To test biological and eco-friendly CPAs as alternatives to traditional CPAs.
2. To produce a formal protocol for trial and testing procedures.
3. To collate results of trials done under the formal protocol and make them available to ACAC.
4. To harness global participation.





Objectives

...amended Feb 2021

1. **To test biological and eco-friendly CPAs as alternatives to traditional CPAs with CORESTA formal protocol and collate related results.**
2. **To collate results and protocols from trials already conducted with biological and eco-friendly CPAs**
3. **To collate results and protocols from trials that will not be done with the formal protocol**
4. **Compile data in a dedicated database and make them available to ACAC.**
5. **To harness global participation.**

Participation is voluntary and is according to interest and involvement in the target biological and eco-friendly CPA.



Activities

- ✓ **June 2018 – Jan 2019: Survey questionnaire on the extent of use and registration of biological and eco-friendly CPAs**
- ✓ **June 2019: Compilation of global biological and ecofriendly CPAs**
- ✓ **June 2019: Protocol formation and Sub-Group website page**
- ✓ **October 2019: Standardisation of protocols and harnessing of global participation**
- ✓ **Jan 2020: Revision to further simplify protocols**
- ✓ **Jan 2020 to date: Efficacy trials/data (Japan, Zim, Malawi)**
- ✓ **Sept 18th 2020: Online meeting**
- ✓ **Feb 2021: Amendment of objectives and submission to SC**
- ✓ **June 2022: Activities update for Scientific commission meeting, data availed to Commission**
- ✓ **April 2023: Meeting Antibes, France**
- ✓ **Currently: collating trial data and that which is already existing**



Trials done with the CORESTA formal protocol (Amended objectives - #1)

CPA a.i	Target Pest/s	Country	Year	Status
1. <i>Trichoderma spp.</i>	Fusarium/ Pythium / Sclerotium	Zimbabwe	2021-23	Ongoing
2. <i>Bacillus subtilis</i>	Rhizoctonia / Pythium	Zimbabwe	2020-23	Ongoing
3. <i>Beauveria bassiana</i>	Aphids	Zimbabwe, Japan	2020-21	Ongoing
4. <i>Azadiractin</i> (Neem)	Aphids	Japan, Zim	2021-23	Ongoing
5. <i>Paecilomyces tenuipes</i>	Aphids	Japan	2021-23	Ongoing
6. <i>Bacillus firmus</i>	Root-knot nematode	Zimbabwe	2021-23	On-going
7. Pelargonic Acid	Suckericide	Zimbabwe	2020-22	Registered

Trial Summary

- **Japan:** *Beauveria bassiana* strain, 1.6×10^{10} spores/ml) applied at the rate of **200 ml/100 litres water**, *Paecilomyces tenuipes* strain T1, 5×10^8 spores/ml) applied at the rate of **400 ml/100 litres water** showed a control effect greater than **50%** for a week without phytotoxicity.
- These results suggest that these two microbial CPAs are prospective candidates for environmentally friendly aphicides



Trial Summary

- **Zimbabwe:** Aphid scores in, *Beauveria bassiana* on its own were comparable to the untreated control whilst the *B. bassiana* and the 50% Imidacloprid treatment combination were comparable to the standard Imidacloprid treatment
- Application of *Beauveria bassiana* on its own resulted in a slight decrease in aphid populations and aphid scores in the treatment were not significantly different from the untreated control at 1 and 2 WAT





Trials done with an in-house protocol (amended objectives - # 2 and 3)

CPA active ingredient	Target Pest/s	Country	Year	Status
1. Trichoderma spp.	Fusarium/ Pythium / Sclerotium	India	Before 2020	Registered
2. <i>Bacillus subtilis</i>	Rhizoctonia / Pythium	India/Zim	Before 2020	Registered
3. <i>Beauveria bassiana</i>	Aphids	India	Before 2020	Registered
4. Azadiractin (Neem)	Aphids	India/Zim	Before 2020	Registered
5. Bacillus firmus	Root-knot nematode	India	Before 2020	Registered
6. Beloukha (Pelargonic Acid)	Suckericide	USA	2020	Registered
7. Prosular oxymatrine	Aphids	Zimbabwe	2021	Registered
8. Plant extract	NEMATODES	Zimbabwe	2021	Registered
9. Diatomaceous Earth	Aphids	Zimbabwe	2021	Registered



Current Trials (amended objectives # 1, 2 and 3)

CPA active ingredient	Target Pest/s	Country	Year
<i>Paecilomyces lilacinus</i>	Nematodes	Malawi,	2022-23
		Zimbabwe	2022-23
<i>Metarhizium anisopliae</i>	Nematodes	Malawi	2023
Neem	Aphids	Japan	2022-23
<i>Beauveria bassiana</i> , <i>Paecilomyces tenuipes</i>	Aphids	Japan	2022-23
<i>Bacillus amyloliquefaciens</i>	Fungicide	Malawi	2023
<i>Trichoderma asperellum</i>	Fusarium	Malawi, Zim	2023
<i>Dolichos kilimandscharicus</i> (Bioactive extracts)	Budworm	Malawi	2023



Conclusion & Way Forward

- **Trials mostly being done with in-house protocols for some participants.**
- **Active trials being done in 3 countries (Japan, Zim and Malawi) (Tanzanai)**
- **Need for more participants for conclusive data.**
- **Appeal for data on any bio- or eco-friendly CPA use**



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THANK YOU

