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Aims

For biological control agents formulation techniques are to be developed in order to meet the growing demand for biopesticides.

A suitable formulation can improve the characteristics of a biological control agent:

- improved handling
- protection from biotic and abiotic stress factors (heat, dryness, UV light, antagonists,...)
- enhanced shelf life
- controlled release into the soil (controlled by environmental conditions and material properties)
- enhanced efficacy

Results

Encapsulation of a nematophagous fungus

to control phytopathogenic nematodes

i.e. *Heterodera*, *Meloidogyne* and *Globodera* in sugar beet, tomato, potato, soy bean,...

enhanced efficacy through capsule formulation:

- reduction of infestation >80%

enhanced shelf life through capsule formulation:

- only slight loss of vitality after air-drying
- temperature stability: no loss of vitality after 3 d at 50°C

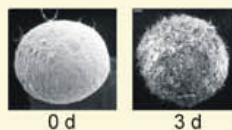


Fig. 1: Mycelial growth of the nematophagous fungus *Hirsutella rhossiliensis* from hollow bead

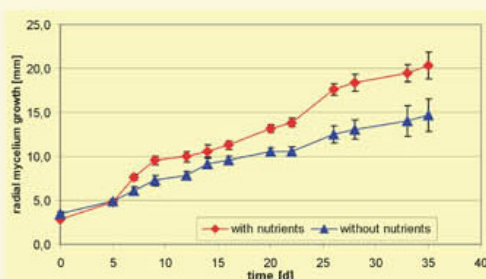


Fig. 2: "Microfermenter": Nutrient reservoir in hollow beads for the nematophagous fungus *Hirsutella rhossiliensis* improves growth and sporulation (capsules with 15% biomass)

Encapsulation of a bacterial antagonist

to control soil-borne phytopathogenic fungi, i.e. *Aphanomyces*, *Pythium* and *Rhizoctonia* in sugar beet, maize, wheat, potato,...

enhanced shelf life through capsule formulation:

- survival after drying up to 32 %



Fig. 3: Preparation of a Ca-alginate bead with *Pseudomonas fluorescens*; 1000x magnification

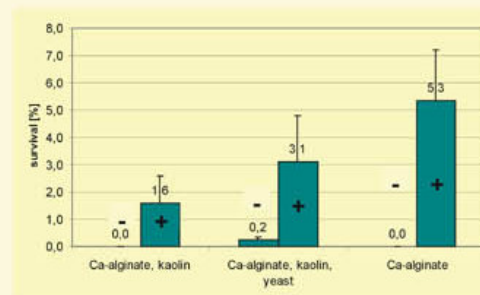


Fig. 4: Influence of a treatment with formulation additive DP 8 on survival of encapsulated and dried *Pseudomonas fluorescens* cells. - without DP8, + with DP8

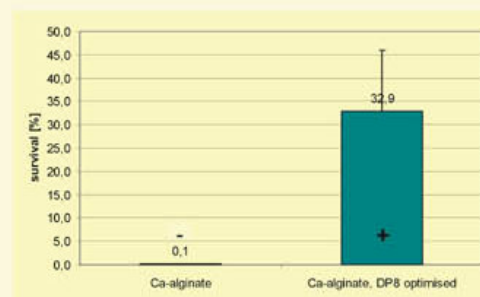


Fig. 5: Influence of an optimised treatment with formulation additive DP8 on survival of encapsulated and dried *Pseudomonas fluorescens* cells. - without DP8, + with DP8

Conclusion

Research into formulation techniques can improve crucial characteristics of biological control agents such as shelf life and efficacy in such a fashion that commercialisation becomes feasible.