DEVELOPMENT OF BACTERIA FORMULATIONS FOR SEED COATING

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Inoculation of seeds is an efficient and convenient way of introducing effective plant-growth-promoting-bacteria (PGPB) to soil and consequently the rhizosphere of plants. However there are still limiting factors for commercial application of biological agents as biofertilizers which is mainly due to poor bacteria survival. Thus, developing formulations that provide high concentrations of microbial inoculant and high survival rates during storage constitute an important step in the development of effective inoculants.

So, the main aim of our work is to create “artificial spores” based on multilayer coatings [1] of good mechanical stability and selective permeability in order to develop environmentally friendly formulation technologies with increased product shelf life and efficient release and activation of encapsulated biomaterials.

To address this challenge we are developing new surface coating solutions based on polyelectrolyte complexes for field application of plant growth promoting bacteria (PGPB), such as *Burkolderia phytofirmans* PsNJ. *B. phytofirmans* PsNJ was chosen because it is a well characterized, prominent and efficient PGPB [2, 3].

The materials tested for seed coating of maize were non-toxic and biodegradable, cost-effective and readily available and include proteins like gelatin and polysaccharides like celluloses, alginate, and xanthan. Depending on the kind of coating adhesive the material concentration was 1% to 10% (w/v). Bacteria concentration used for encapsulation was 10^7 cfu/mL of coating agent. Coating was carried out in a SATEC ML2000 seed coater. Single and multilayer coatings were performed. Coating quality was defined by visual inspection, while cell viability was determined by plating serial dilutions in Luria-Bertani agar. The effect of coating on seed germination was investigated in agar plates. Results compiled up to now showed favorable effects in germination, such as germination of maize treated with bacteria was enhanced by up to 60% compared with the untreated controls. Studies on release kinetics and stability testing are in progress.

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