

SESSION 6

Applications of PGPR in Agriculture

Poster VI.65

Selection of *Bacillus* spp. for biological control of diseases and growth promotion of soybean

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Plant growth promoting rhizobacteria (PGPR) are able to promote biocontrol, induce plant growth and improve crop yield. The genus *Bacillus* is one of the most studied biocontrol agent, but information about native *Bacillus* from Mato Grosso do Sul are scarce. The purpose of this study was to evaluate *Bacillus* strains isolated from bromeliads for biocontrol of soybean white mold disease and in addition to promote plant growth. Initially, 32 bacilli isolates were analysed by PCR for the presence of the genes *bamD*, *ituD*, *fenF*, *bacAB*, *mrsA* and *sfP* coding for antimicrobial molecules. In vitro bioassays with isolates positive for the presence of the target genes were carried out against four pathogenic fungi *Sclerotinia sclerotiorum*, *Macrophomina phaseolina*, *Rhizoctonia solani* and *Colletotrichum truncatum*. The best isolates were the assessed in vivo to control the white mold disease in *Potencia RR* and *M6210 IPRO* soybean cultivars. The same soybean cultivars were used for the plant growth promotion test inoculated individually with the commercial product or co-inoculated with 8 different bacilli strains, besides the uninoculated control. The results showed that the genes *bamD*, *ituD* and *fenF* were detected in 25% of the tested isolates while *bacAB* was observed in 53% of bacillus strains. No PCR amplified product was observed for the genes *mrsA* and *sfP*. The in vitro bioassays showed that two isolates, VBE19 and VBE57, were able to inhibit all four pathogens tested while only two other isolates, VBE05 and VBE01 provided a reduction of 39.1% and 37.5%, respectively of the disease progress during the in vivo bioassays. The coinoculation treatments presented higher number of nodules in the cultivar *Potencia RR* while higher speed rates of emergency, differing statistically from control and the commercial product, were observed in the cultivar *M6210 IPRO*. Individual inoculation of the isolate VBN02 or co-inoculated with *Bradyrhizobium* increased fresh shoot mass, fresh root mass, root dry mass and rootlength. In conclusion, our results showed that the *Bacillus* tested showed potential for biocontrol of white mold and promoted growth of soybean plants.

Keywords: rhizobacteria; inoculation; biocontrol.

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