

DEVELOPMENT OF A BIOHERBICIDE AGAINST PARASITIC WEEDS

Crop protection against parasitic diseases is a major challenge in agriculture. Chemical control is still widely used, but it is not always effective and contributes to environmental contamination. Parasitic weeds, such as *Striga* and *Orobanche* affect the growth of a wide variety of crops of agronomic interest (corn, rice, sorghum, millet, sunflower, rapeseed, tobacco, tomato, etc.), whether in temperate (*Orobanche*), or tropical (*Striga*) zones causing significant yield losses on many crops. The laboratory has identified a bacterial strain, *Azospirillum brasilense*, which is able to inhibit the growth of *Striga* and *Orobanche* and has characterized the involved biologically active metabolites. These new biological solutions are in accordance with European policy which goal is to reduce the use of chemical inputs and the development of biological solutions for cropping cereals.

DESCRIPTION

The invention offers solutions to biologically control the growth of *Striga* and *Orobanche* parasitic weeds: using (i) , *Azospirillum brasilense*, which was deposited at the CNCM (National Collection of Micro-Organism Cultures, Institut Pasteur) or (ii) the biological active metabolites it produces. The *Azospirillum brasilense* strain has the ability to inhibit in vitro the growth of *Striga hermontica* and *Phelypaea ramosa* and, in soil microcosms, to protect sorghum against *Striga* and stimulate its growth.

STAGE OF DEVELOPMENT

The bacterial strain *Azospirillum brasilense* and its biologically active metabolites are able, to stop the elongation of *Striga* and *Orobanche* plantlets in vitro (using a microtiter-plate bioassay) and to inhibit the growth of *Striga* in pot experiments.

It is now necessary to test the efficiency of the strain and its metabolites against *Striga* and *Orobanche* in the field in order to specify their mode of application (concentration, input frequency, seed coverage or spray etc.) and check for the environmental toxicity of proposed solutions.

RESEARCH TEAM

Claire PRIGENT-COMBARET

Microbial Ecology of Lyon - UMR5557



ADVANTAGES / NOVELTY

Bacterial strain and its biologically active metabolites :

- Are capable to inhibit the elongation of the parasitic procaulome
- Block the growth of the parasite.
- Reduce significantly the level of viable seeds in infested soil.
- Have no toxicity in humans

APPLICATIONS

Agronomy :

- Bioherbicide against *Striga* and *Orobanche* parasitic weeds
- Stimulate crop growth in field
- Seed protection

INTELLECTUAL PROPERTY

Patent pending in PCT, priority date: April 29th, 2014 (FR14 53891)

COLLABORATION TYPE

Pulsalys offers to grant patent license and looks for a partnership with an industrial in order to develop a low environmental impact product able to inhibit the growth of parasite weeds.