

Priming of soybean to enhance the plant defense against phytonematodes

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In their natural environment plants are continuously exposed to a wide range of abiotic and biotic stresses, for example pathogens. Those can lower the crop productivity and influence our food security. Priming the crop plants for an enhanced defense against pathogens is an environmentally friendly strategy of plant protection. Prior priming of plants by an inducer results in a faster and stronger response of the plant defense to following pathogen attack. In our work we tested whether soybean can be primed for enhanced defense against the phytonematode *Pratylenchus penetrans*, which is a major pest of soybean in Germany. As inducer we used *Sinorhizobium meliloti* strain expR+, producing *N*-acyl homoserine lactones

(AHL) as signaling molecules. In a greenhouse experiment, the rhizosphere of soybean plants (cv. Primus) was inoculated with the expR+ strain for two times and consecutively. Two weeks after this inoculation, the plants were exposed to *P. penetrans*. Significantly less nematodes invaded the roots of expR+ treated plants compared to non-primed plants, or compared to plants inoculated with the attM strain, a derivative of expR+, which does not accumulate AHL. This suggested that priming of soybean with AHL might be a useful strategy for plant protection. In the next step we will test whether soybean varieties differ in priming capacity, thus making it a possible target for breeding approaches.