

## THE EFFECT OF *RHIZOBIUM LEGUMINOSARUM* STRAIN GENOTYPE ON HOST PLANT PHENOTYPIC EXPRESSION

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**Abstract.** *The use of legumes, a wholesome source of protein, in commercial agriculture is increasing rapidly throughout the world. Legume crop yield is highly influenced by the symbiotic relationships with nitrogen fixating bacteria – rhizobia that supply plants with the necessary amount of nitrogen. This symbiotic relationship is beneficial also for the next crops, as the soil is enriched with nitrogen, thus limiting the use of chemical fertilizers. Legume use in agriculture is based on efficient rhizobia activity, therefore research on rhizobia is of great importance. In this study we focus particularly on Rhizobium leguminosarum. There are 13 different R. leguminosarum strains in the collection of Latvia University of Agriculture. These strains have shown different nitrogen fixating activity as well as different effect on host plant growth. Previous studies have observed existence of genotypic differences between R. leguminosarum strains. For successful R. leguminosarum use in agriculture, it is important to assess the genetic impact on the crop production. To fully identify these R. leguminosarum strains, it is necessary to use molecular biology methods in order to find out the genetic differences between the strains. Depending on the chosen R. leguminosarum strain, host plant phenotypic characteristics can change; also plant biochemical content (i.e., protein content) can be altered. The efficiency in some R. leguminosarum strains can be explained by genetic differences between strains, as well as plant and microorganism genetic interaction. Differences in R. leguminosarum strain activity and efficiency, explained by genetic differences between the strains, open new opportunities for the rhizobium use in agriculture. This project is supported by EU 7<sup>th</sup> frame EUROLEGUME project (Enhancing of legumes growing in Europe through sustainable cropping for protein supply for food and feed).*

**Key words:** *rhizobia, legumes, crop yield, identification of R. leguminosarum.*