

## **Abstract**

Nitrogen as the fourth most abundant element of living organisms and the limiting factor of the aquatic and terrestrial ecosystem is still a major problem for scientists around the world. Today, developed countries are able to store their inputs in the form of depositions in the same values, but there is a question of long-term effects of chronic nitrogen add-ons. The aim of the thesis is to compare the effect of long-term and one-time fertilization on various plant species, especially on grass and nitrogen fixation plants in relation to the age of the soil on which they grow. This connection will be investigated by the ANOVA method in a practical experiment on selected plants growing on different old soils that have been or have not been fertilized for long periods with nitrogen. As model organisms, I chose a nitrogen fixing device, *Lotus corniculatus*, and *Festuca rubra* an unstable plant, which is also a representative of the grass. One-off fertilization had a positive effect on the growth of above-ground biomass on all plants. We have a different impact according a type of plant on long-term fertilization. In this case, I recommend more detailed testing of a wider sample of plants.