

## ABSTRACT

In spite of the Green Revolution's success, the growing world population together with the degradation of agricultural land and its decrease create pressure on increasing the food production rate and the volume of crop production. Economic reasons and the whole society emphasis on environmental protection lead to the search of new possibilities to increase the efficiency of necessary inputs, esp. energy, nitrogen fertilizers and plant protection products.

Economically significant wheat species (*Triticum aestivum* L. and *Triticum durum* Desf.) belongs with its area to the most grown crops in the world and they ensure an important part of the food of the world's population. Agro-ecological conditions under which wheat is grown, ranges from semiarid areas to areas with frequent precipitation, from tropics to cool areas in high latitudes with short growing season. Crop systems include various methods of plant nutrition and irrigation, different crop rotations and various soil treatment.

This range of soil-climatic and production conditions also corresponds to a broad range of soil nitrogen availability and general conditions for nutrient uptake and utilization. Amount and availability of individual forms of nitrogen for plants varies during their ontogenetic development as a consequence of dynamics of soil nitrogen transformation and depending on specific weather conditions.

Nitrogen is an essential macronutrient to obtain the required yield and quality of grown plants acting in interaction with other nutrients and water availability. To increase efficiency of utilization of nitrogen and other nutrients it is necessary to learn and interconnect the knowledge of physiological, biochemical and molecular mechanisms controlling nitrogen uptake, assimilation and utilization.

The subject of this thesis was determined by the need to utilize new findings concerning nitrogen uptake and utilization by plants in applied agricultural research. Its main aim was to determine the influence of ammonium, nitrate and amide forms of nitrogen nutrition on nitrogen uptake by roots and leaves of common wheat and its subsequent utilization.