

Oilseed rape (*Brassica napus* L.) is one of the main oil plants that are cultivated in the world. In the EU, Poland is one of the leading producers of oilseed rape. An increase in the world production of oilseed rape occurred after a drastic reduction or even elimination of erucic acid in the process of breeding as well as a significant decrease in the glucosinolate content. This made oilseed rape oil a high-quality fat and a source of valuable feed. The yield of winter oilseed rape is higher than the yield of spring oilseed rape, but part of its growing season is during the winter months, which is connected with the exposure of the plants to frost. Well cold acclimated (during autumn) oilseed rape plants are able to easily survive frost, especially under snow cover. However, the problem of recent years is the occurrence during autumn (or early spring) short periods with abnormally elevated temperatures. It results from climate changes and disturbs the natural process of preparing plant metabolism to survive frost (reducing plant frost tolerance). The phenomenon is called deacclimation of plants. As a result of the decreased frost tolerance farmers in Poland are forced to plow entire winter oilseed rape plantations injured during the winter. In experiments planned in proposed project we are going to determine which of the oilseed rape cultivars have high frost tolerance despite the occurrence of deacclimation (which cultivars have a higher deacclimation tolerance). We will also look deeper into specific physiological and biochemical changes that occur during the deacclimation process, such as changes in the hormonal homeostasis, changes in the properties of cell membranes (chloroplast membranes) and the dynamics of changes in protective proteins or selected elements of the antioxidant system. It will enrich the current knowledge in the field of deacclimation research. The implementation of the project will also answer the question whether the use of plant steroid hormones - brassinosteroids, increases oilseed rape tolerance to frost after periods of deacclimation. Determining that the frost tolerance of oilseed rape is improved by brassinosteroids may open the way for the use of these compounds for spraying the plants in agricultural practice, especially in regions where the largest frost injuries of this species are associated with deacclimation processes.