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**The title of dissertation:** Control of Sosnowskyʼs Hogweed (*Heracleum sosnowskyi*) Seed Formation by Physiologically Active Substances

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**Summary EN**

The spread of alien species and their destructive impact on native ecosystems is one of the most pressing global issues today. Among the alien species registered in Lithuania, Sosnowsky's hogweed (*Heracleum sosnowskyi* Manden.) stands out for its environmental and human health hazards. Various measures, including herbicides, is used to curb the spread of Sosnowsky's hogweed, but their toxicity limits their use. Sosnowsky's hogweed produces seeds once in lifetime and then dies. Therefore, by preventing seed germination, inducing seedlessness, embryo abortion, and halting embryogenesis, its spread could be restricted. This led to the idea of using the phytohormones gibberellins and auxins to control seed formation and development in Sosnowsky's hogweed.

This dissertation aimed to elucidate the effect of exogenous GA3 and other bioactive substances on fruit development in the central and lateral parts of the terminal and satellite umbels in relation to changes in the hormonal system. The research found that GA3 can contribute to the development of environmentally friendly measures for controlling the spread of invasive monocarpic hogweed species due to its ability to reduce seed germination, induce seedlessness, embryo abortion, halt embryogenesis, and reduce seed size. The results presented in this thesis provide a fundamental basis for an environmentally friendly technology to halt the spread of Sosnowsky's hogweed and mitigate the negative impact of this invasive plant.

**LIST OF PUBLICATIONS OF THE DISSERTATION TOPIC**

1. Jurkonienė S., **Žalnierius T.**, Gavelienė V., Švegždienė D., Šiliauskas L., Skridlaitė G. 2016 Morphological and anatomical comparison of mericarps from different types of umbels of *Heracleum sosnowskyi*. Botanica Lithuanica 22(2),161–168. <https://doi.org/10.1515/botlit-2016-0017>
2. Koryznienė D., Jurkonienė S., **Žalnierius T.**, Gavelienė V., Jankovska-Bortkevič E., Bareikienė N., Būda V. 2019. *Heracleum sosnowskyi* seed development under the effect of exogenous application of GA3. – PeerJ 7:e6906. <http://doi.org/10.7717/peerj.6906>. (Q1)
3. **Žalnierius T.**, Šveikauskas V., Aphalo P.J., Gavelienė V., Būda V., Jurkonienė S. 2022. Gibberellic acid (GA3) applied to flowering *Heracleum sosnowskyi* decreases seed viability even if seed development is not inhibited. – Plants Basel, 11 (3), 1–11. <http://doi.org/10.3390/plants11030314>. (Q1)