

UNIVERSITY OF LIFE SCIENCES "KING MIHAI I" FROM TIMIŞOARA FACULTY OF ENGINEERING AND APPLIED TECHNOLOGIES

"MULTIDISCIPLINARY CONFERENCE **ON SUSTAINABLE DEVELOPMENT**" Section



"Research, innovation and technology transfer in the Horticulture, Forestry and Biotechnologies fields" 30 - 31 May 2024

SEED GERMINATION OF EXOTIC SPECIES UNDER THE INFLUENCE OF DIFFERENT BIOSTIMULANTS

Sîngeorzan Steluța-Maria^{*}, Morar Irina M., Truța Alina M., Arion Iulia D., Covrig Ilie, Colișar Alexandru, Vlasin Horia D.

Faculty of Forestry and Cadastre, University of Agriculture Science and Veterinary Medicine Cluj-Napoca, Calea Mănăștur, Nr. 3-5, 400372, Cluj-Napoca, România

Abstract: Seed germination is an essential process in the plant life cycle, and the use of some growth stimulants can significantly influence this process. The present paper has as object of study the investigation of the effect of different growth stimulants on seed germination of several exotic species such as: Korean fir (*Abies koreana*), cypress (*Cupressus sempervirens*), California cypress (Chamaecyparis lawsoniana), Mediterranean pine (*Pinus pinea*), Macedonian pine (*Pinus peuce*). The growth stimulants that were used: Atonik, Cropmax and Sprintene. It was noticed that the germination capacity of the exotic species used were significantly influenced by the application of various biostimulants. These kind biostimulants are known for their unique content of organic compounds that have been shown to enhance plant germination and development. Regarding the 3 types of biostimulants applied, Cropmax and Sprintene significantly improved the germination rate of all the species analyzed, compared to the control variant. The conclusions of this paper will highlight the importance of using growth stimulants in the seed germination capacity of some exotic species. These results will be useful in optimising cultivation and care practices, thus contributing to the conservation and diversification of plant biodiversity.

Introduction

Exotic forest species are tree species that are not native to a particular region, but are introduced from other geographical areas for various purposes, such as forestry and landscaping. These species can bring multiple economic and ecological benefits, but they can also pose significant challenges to local ecosystems. The introduction of exotic forest species into a new environment can face various challenges, including difficulties in seed germination. Therefore, the use of biostimulants for germination may be necessary to support this process so that they can mitigate the negative impact of environmental stress and improve or maintain seedling productivity (Graziani et al., 2022).

Material and method

Results and discussions

The best results in terms of seed germination capacity of the chosen exotic species were registered for seeds treated with Cropmax and Sprintene biostimulants, germination percentages registering values between 40-80%.









The seeds of the four exotic species were harvested from two different regions: Italy-Saturnia (Pinus pinea, Cupressus sempervirens), Romania-Cluj-Napoca (USAMV Cluj-Napoca Campus) and Baia Mare (Chamaecyparis lawsoniana, Pinus peuce, Abies koreana). As for the treatments used to stimulate germination capacity, the following biostimulants were used: Atonik, Cropmax, Sprintene). For their germination, special Linhardt pots were used, with special paper substrate, made of vegetable cellulose, and after the emergence of seedlings they were transferred to alveoli with peat substrate.





Fig .1. Germination capacity – *Martor* variant



Fig 2. Germination capacity – *Atonik* variant



Fig 3. Germination capacity – *Cropmax* variant Fig 4. Germination capacity – *Sprintene* variant For germination in Abies koreana species, there was a visible increase in germination percentage, comparing the 4 treatments applied (Fig. 4.). The highest germination percentage was in the case of the Sprintene biostimulator (83%), and in the case of seeds of *Cupressus sempervirens* species (Fig. 6.) the highest germination percentage was in the case of Cropmax treatment (83%).







Germination of Pinus pinea species for the four treatments

Fig 7. Germination of Chamaecyparis lawsoniana species for the four treatments

In the case of *Pinus peuce* seeds, as in the case of *Pinus pinea* seeds, the percentages were lower, but the best germination results were recorded for the Cropmax 36% and Snimble 40% variants.

For seeds of *Pinus pinea*, germination slightly lower, percentages were ranging from 13% in the control variant to the best result in the Sprintene biostimulator variant 46%.

Germination of Pinus peuce species for the four treatments



Fig. 8. Germination of Chamaecyparis lawsoniana species for the four treatments



Fig 7. Germination of *Chamaecyparis lawsoniana* species for the four treatments

Fig 6. Germination of *Cupressus sempervirens* species for the four treatments Very good results were also recorded in the case of *Chamaecyparis lawsoniana* seeds, where, as in the other species treatments with the biostimulants Cropmax and Sprintene registered percentages of 63% and 56%, respectively.

Conclusion

The study concluded that seed germination in the exotic species studied may be influenced by the application of treatments with biostimulants, which can help improve the productivity of seedlings, but this is also influenced by the species.