

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY
W SZCZECINIE

PIOTR ŻURAWIK

WPŁYW SUSZU KREWETKOWEGO I CHITOZANU ORAZ METOD
UPRAWY NA WZROST, ROZWÓJ, WARTOŚĆ DEKORACYJNĄ
I PLON BULW POTOMNYCH FREZJI (*Freesia* Eckl. ex Klatt)

SZCZECIN 2013

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The impact of dried shrimp waste and chitoson as well as of the methods of cultivation on growth, development, decorative values and yield of cormlets (*bulbotuber*) of freesia (*Freesia* Eckl. ex Klatt)

Summary

Between 2005 and 2011 in the West Pomeranian University of Technology in Szczecin, in a climatised chamber and an unheated foil tunnel, three independent experiments were carried out to check what impact had a dose of dried shrimp waste, used as a substrate component, as well as the form, concentration and methods of chitoson application on the course and length of development stages, vegetative features, decorative value and the yield of cormlets of freesia cultivated for flowers. It was also compared how varieties of freesia, belonging to various cultivation groups respond to the applied factors.

In the tests, in which dry waste from shrimp processing was used as a substrate component, it was found out that it caused an increase in the substrate's salt content, which had an impact on delaying the beginning of germination as well as coming into ear and flowering of the Beach group freesia. The larger the dose, the stronger the impact. The 'Silver Beach' variety proved to be more tolerant to substrate salt content. The dose of dry shrimp waste was also decisive for the growth and yield of the plant. At the end of the vegetation period, the freesias, growing in the substrate with an addition of 2,5% of dried shrimp waste were the highest, however, in the dry waste enriched by 5%, they generated the largest number of sprouts, the number of leaves on the leader and their total number. The substrate enrichment with dried shrimp waste in doses of 2,5 and 5% had an impact on an increase in the received yield of cormlets. A further increase in the dose of dry shrimp waste had an impact on the reduction of mass increment factors and the number of cormlets. The freesias cultivated in the substrate with an addition of the largest dose of dried shrimp waste, i.e. 15% had deformed corms which were not good for planting in the subsequent cultivation cycle. The addition of dried shrimp waste to the substrate, independently on the dose, caused at the end of vegetation an increase in N and K content in the leaves of freesia, but a reduction in the Fe and Zn content.

Chitosan of the molecular mass of $10\,000\text{ g}\cdot\text{mol}^{-1}$, applied in the climatised chamber contributed to the acceleration of freesia flowering. The impact of this compound was, however, dependent on the variety being cultivated. A stronger impact was ascertained in the plants of 'Lisa' and 'Bon Bon' varieties, characterized by a longer production cycle, and weaker in the case of 'Silver Beach' variety of freesia, distinguished by a shorter period of cultivation. The impact of chitosan on the vegetative and generative features and the yield of corms in control conditions, depended upon the form and methods of this compound application. When applying the acetic form, plants with a larger number of sprouts, more intensely green leaves, and longer first-order inflorescence were obtained, and they also had a larger coefficient of total corm mass increment and of the number of secondary corms increments

than when applying the chloride form. Independently on the method of application, this compound had it that the plant generated longer first-order inflorescence sprouts and also longer first-order inflorescences with a larger number and diameter of flowers. Keeping the corms in water before planting and watering or spraying the plants with a chitosan solution caused an increase in the increment coefficient of the total corm mass of the cultivated freesia. However, spraying the plants with chitosan solution caused an increase in the coefficient of increment of the number of secondary corms, but it decided upon the reduction in the coefficient of increment of secondary corms mass.

In the foil tunnel, chitosan, independently on the method and concentration of application, had an impact on the acceleration of freesia flowering. This compound stimulated also the growth of the plant, forming a larger number of sprouts and of leaves in total and also had an impact on the increase in the index of leaves becoming green, the length of the inflorescence leader, the diameter of flowers and the number of second-order inflorescences. An increase in the chitosan concentration from 0,2% to 0,4% had it that the plants cultivated were higher, with a larger number of sprouts and leaves on the leader, and they were characterized by more intensely green leaves and longer inflorescence sprouts and first-order inflorescences, and also by a larger number of flowers. Chitosan solution in a concentration of 0,4% had also an impact on obtaining a larger coefficient of mass increment and a total number of corms and the coefficient of increment of secondary corms number. Chitosan applied while spraying the plants every 7 or 14 days contributed to an increased number of formed sprouts and leaves on the leader. It caused an increase in the coefficient of increment of the secondary corm number and a reduction in the coefficient of their mass increment. Treating freesia with chitosan caused an increase in the N, P and Mn content in the leaves at the end of the period of vegetation.