

Foreword

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Alien pest species in agriculture and horticulture in Finland

An alien species is defined as an organism that occurs outside its natural past or present range and dispersal potential, and whose dispersal and presence is due to intentional or unintentional human action. Recent development in human activities has affected both the immigration and success of alien species to a greater extent than ever previously. The growth of global trade and travel has increased immigration pressure in terms of the number of potential immigration pathways and events. Changes in land use have provided new niches and human-mediated climate change has created more suitable climatic conditions that favour the success of many alien species outside their natural ranges. In their new ranges, alien species usually harm the recipient ecosystems in several ways and control of new invaders may require considerable effort once they have become established. Therefore, anticipating immigration is important for successful control of alien species.

There is a long history of range expansion of alien species aided by humans in agriculture and horticulture. Crop species and horticultural plants themselves are alien species in most regions of the world. Furthermore, their production has provided niches for numerous plant pathogens and insect pests and created open habitats for weed species. Modern year-round greenhouse production has enabled the success of tropical and sub-tropical pests also in the northern climate zones. Greenhouses can also act as stepping-stones for exotic pests to transfer to the natural surroundings. In agricultural and horticultural production, alien pest species cause economic loss by decreasing the production or lowering the quality of products. Regular control measures are applied to limit their populations, which naturally increases costs. In the future, climate change can be assumed to bring challenges in the form of new alien pest species. This is especially true for the northern regions, such as Finland, where the climatic conditions have to date successfully prevented the establishment of permanent populations of many alien pest species. Introduction of new crop species – also a consequence of climate change in northern regions – will likely favour some new alien pests.

This special issue of Agricultural and Food Science focuses on the alien pest species associated with agricultural and horticultural production in Finland. The main aim of the special issue is to provide updated reviews on the current status of major groups of alien pest species, including plant pathogens, insect pests and weeds. Anticipation of the future immigration of alien pest species requires the development of pest risk-assessment methods as well as modelling tools for predicting the potential risk of expanded geographical distribution. This special issue addresses the study of the agricultural and horticultural pests in the context of invasion ecology, providing a theoretical framework for understanding species invasions on large spatial scales. In the increasingly globalized world, solutions for local pest problems may lie in better understanding of the relevant phenomena in a wider context.