The Chancellor of Ghent University has the honour of inviting you to attend the public
defense of the doctoral dissertation of

ir. Hanne Denaeghel

Title of the doctoral dissertation:

Advanced breeding techniques to induce variation
in woody ornamentals.

The public defence will take place on Tuesday the 7th of June 2018 at 16:00 in room E 1.015
at Campus Coupure, Coupure Links 653, 9000 Ghent.

There will be a contiguous reception to which you are heartily invited.
Please confirm your attendance before the 1st of June to:

hannedenaeghel@gmail.com
or 0494/89.16.36

Promoters

Prof. dr. ir. Marie-Christine Van Labeke
Ghent University
Faculty of Bioscience Engineering
Department Plants and Crops

Dr. ir. Katrijn Van Laere
Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)
Plant Sciences Unit
Applied Genetics and Breeding

Board of examiners

Prof. dr. ir. Kris Verheyen
Chairman
Ghent University
Faculty of Bioscience Engineering
Department Environment

Prof. dr. ir. Stefaan Werbrouck
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Prof. dr. Renate Müller
Kopenhagen University
Faculty of Sciences
Department of Plant and Environmental Sciences

Prof. dr. Paul Goetghebeur
Ghent University
Faculty of Sciences
Department of Biology

Dr. ir. Emmy Dhooghe
Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)
Plant Sciences Unit
Applied Genetics and Breeding

Abstract of the doctoral research

Constant product innovations are commercially very important for ornamental growers,
especially in the market segment of visually attractive plants. Desired novelties are
trend-sensitive. Nowadays, as gardens keep getting smaller, the demand for compact,
potted ornamentals increases. Further interesting characteristics are winter hardness,
routine against variable biotic and abiotic stresses, flower color and shape, etc.

Escallonia and Sarcococca were selected as commercially interesting shrubs by
BestSelect CVBA, a cooperation of Flemish ornamental growers. These genera are rather
unknown and no controlled breeding programs have been set-up before. In this dissertation,
these two genera were used as case-studies for woody ornamentals, to implement more advanced breeding techniques. Firstly, interspecific hybridization was
attempted on the genus Sarcococca. Hereby, the use of molecular and cytogenetic tools
were evaluated to determine cross compatibility of parental species and to verify the
hybrid status of the obtained progeny. Secondly, protocols for polyploidization and
co-cultivation with rhizogenic Agrobacterium strains were optimized to induce new genetic
variation into the genus Escallonia. Until now, these techniques are unexploited for
woody ornamentals, yet they offer countless opportunities to create novel, interesting
variation for the development of visually attractive and/or healthier plants. Tetraploids
of E. illinita, E. rosea and E. rubra were obtained. A proof-of-concept is delivered for
successful infection of Escallonia with rhizogenic Agrobacterium strains; hairy roots
containing rol-genes were produced. Finally, a robust phenotyping approach was
developed based on image analysis, which allows the objective and quantifiable
evaluation of many plants and characteristics. Several interspecific Sarcococca hybrids
and Escallonia tetraploids are currently under field-evaluation for their commercial
value.

Brief Curriculum Vitae

Hanne Denaeghel (*Assebroek, 11 December 1989) graduated with distinction as Master
of Science in Bio-engineering in 2012 at Ghent University. After 2 years of breeding work
with winter rape seed at Bayer CropScience, she started in 2014 as PhD-student at ILVO
in Melle in cooperation with Ghent University, Department of Plants and Crops. As
doctoral fellow at ILVO within the Plant Sciences Unit - Applied Genetics and Breeding,
she worked from April 2014 until March 2018 on the project ‘Advanced breeding
techniques to induce variation in woody ornamentals’ in a cooperation with
the ornamental growers of BestSelect CVBA. She tutored two thesis students and three
interns, presented her results on various international conferences, symposia and
workshops, and authored several peer-reviewed scientific publications.