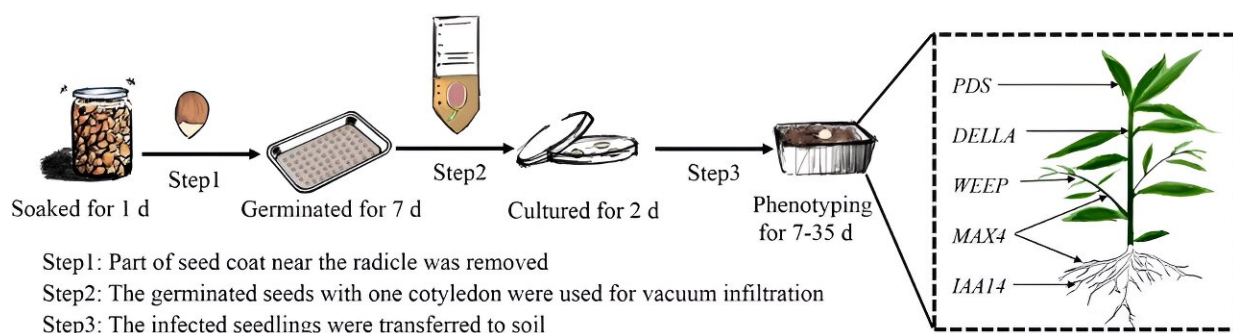


Scientists develop new TRV vector-based method for peach gene analysis

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A simple procedure for transformation of peach seedlings. Credit: *Horticulture Research* (2024). DOI: 10.1093/hr/uhae155

Peach, a valuable crop within the Rosaceae family, has historically faced challenges in genetic research due to the lack of robust transformation techniques. Current methods are often limited by tissue type and developmental constraints, hindering functional gene studies.

While gene silencing methods like virus-induced gene silencing (VIGS) have shown promise, their application in peach has been restricted by technical complexities. These challenges underscore the urgent need for more flexible and effective gene analysis techniques.

Scientists at Henan Agricultural University have addressed this gap with a [novel TRV vector-based method](#), as reported in *Horticulture Research*

on June 3, 2024. The technique employs a three-step procedure to efficiently silence genes related to key plant architecture traits, such as branch angle and height. By breaking down existing barriers in [genetic transformation](#), this method offers a valuable tool for researchers exploring the genetic underpinnings of plant growth.

The study's method begins by removing the seed coat and one cotyledon from germinated seeds, followed by vacuum infiltration with *Agrobacterium* containing TRV vectors. The seedlings are then grown in soil for phenotyping. This approach achieved gene silencing rates between 48% and 87%, effectively targeting genes like PpMAX4 and PpWEEP.

Notably, silencing PpMAX4 increased lateral branching and root mass, while PpWEEP silencing resulted in pendulous growth in dark conditions. The method also succeeded in silencing multiple homologous DELLA genes, addressing functional redundancy and enabling detailed analysis of gene roles in peach growth and development.

"This method transforms our approach to gene [functional analysis](#) in peach and potentially other [woody plants](#)," said Dr. Jiancan Feng, one of the senior researchers.

"By overcoming technical barriers in genetic transformation, it provides a highly efficient tool to investigate genetic functions that influence key traits in seedlings."

The method's potential extends beyond [peach](#), offering promising applications in breeding programs for various woody species. By facilitating precise analysis of genes linked to growth traits, this approach could significantly impact tree genetics research, supporting targeted breeding strategies aimed at enhancing crop resilience and performance.

Future studies will focus on optimizing transformation efficiency and exploring its use in other economically important species.

More information: Jun Cheng et al, A simple and efficient gene functional analysis method for studying the growth and development of peach seedlings, *Horticulture Research* (2024). [DOI: 10.1093/hr/uhae155](https://doi.org/10.1093/hr/uhae155)

Provided by Henan Agricultural University

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