



HAL
open science

Transcriptomic profiles highlight the role of ABA signalling in the regulation of sweet cherry flower bud dormancy

Noémie Vimont, Mathieu Fouché, José Antonio Campoy, Adrián Schwarzenberg, Mirela Domijan, Frank Jamois, Mustapha Arkoun, Jean-Claude Yvin, Philip A Wigge, Elisabeth Dirlewanger, et al.

► To cite this version:

Noémie Vimont, Mathieu Fouché, José Antonio Campoy, Adrián Schwarzenberg, Mirela Domijan, et al.. Transcriptomic profiles highlight the role of ABA signalling in the regulation of sweet cherry flower bud dormancy. 10th International Rosaceae Genomics Conference (RGC 10), Dec 2020, Barcelone, Spain. hal-03318896

HAL Id: hal-03318896

<https://hal.science/hal-03318896>

Submitted on 11 Aug 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Transcriptomic profiles highlight the role of ABA signalling in the regulation of sweet cherry flower bud dormancy

N. Vimont, M. Fouché, J.A. Campoy, A. Schwarzenberg, M. Domijan, F. Jamois, M. Arkoun, J.-C. Yvin, P.A. Wigge, E. Dirlwanger, S. Cortijo, B. Wenden (benedicte.wenden@inrae.fr)

Univ. Bordeaux, INRAE, Biologie du Fruit et Pathologie, UMR 1332, 33140 Villenave d'Ornon, France; Agro Innovation International - Centre Mondial d'Innovation - Groupe Roullier, 35400 St Malo, France; The Sainsbury Laboratory, University of Cambridge, Cambridge CB2 1LR, United Kingdom; Dept. of Mathematical Sciences, University of Liverpool, Liverpool L69 7ZL, United Kingdom; Leibniz-Institute für Gemüse- und Zierpflanzenbau (IGZ), Plant Adaptation, Grossbeeren, Germany

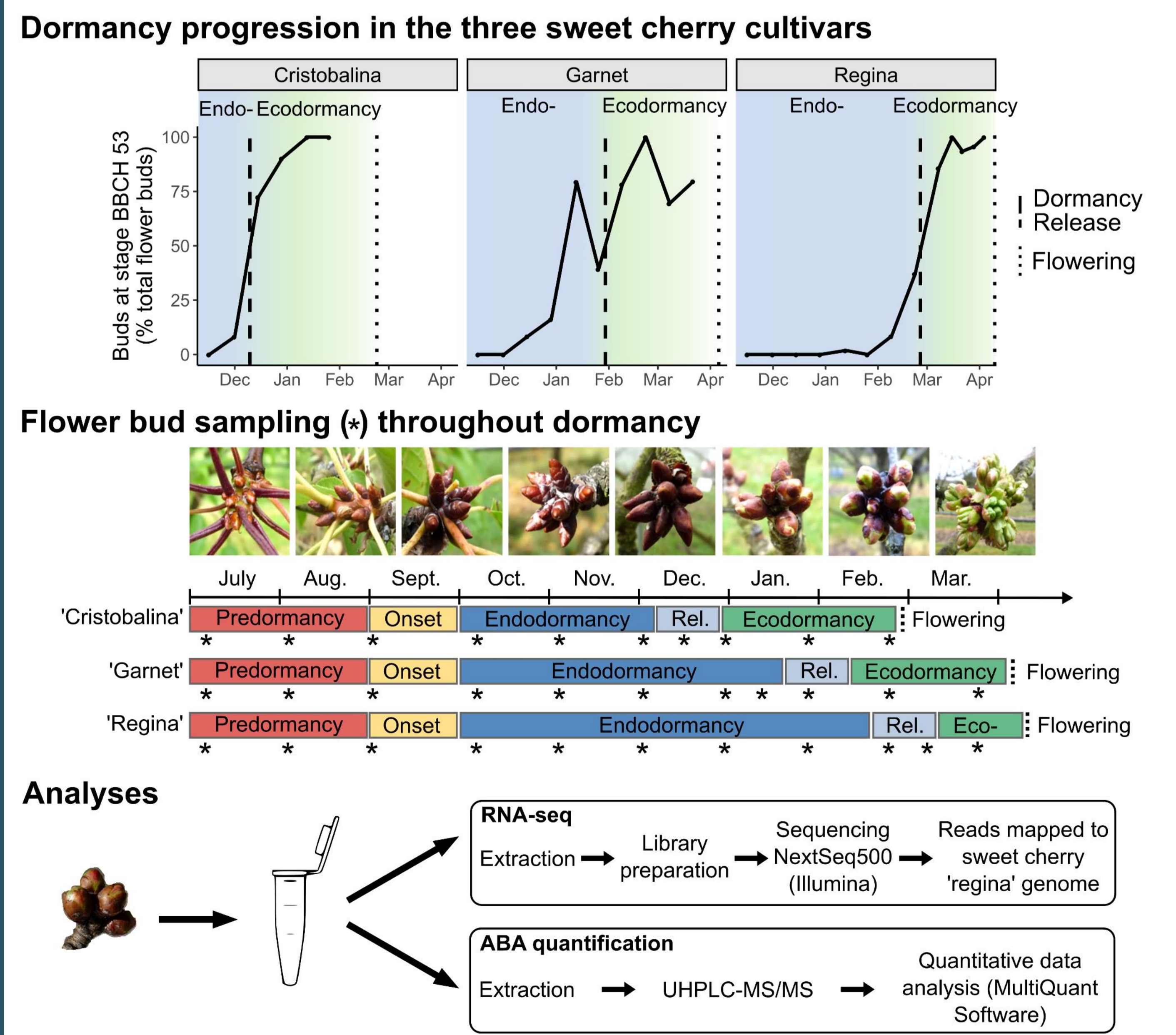
Introduction

Bud dormancy is a crucial stage in perennial trees and allows survival over winter and optimal subsequent flowering and fruit production. Recent work highlighted physiological and molecular events occurring during bud dormancy in trees, including a key role for ABA signalling in the control of dormancy onset and release in several temperate tree species. In order to further elucidate how ABA signaling pathway controls dormancy progression in the flower buds of sweet cherry cultivars, we combined:

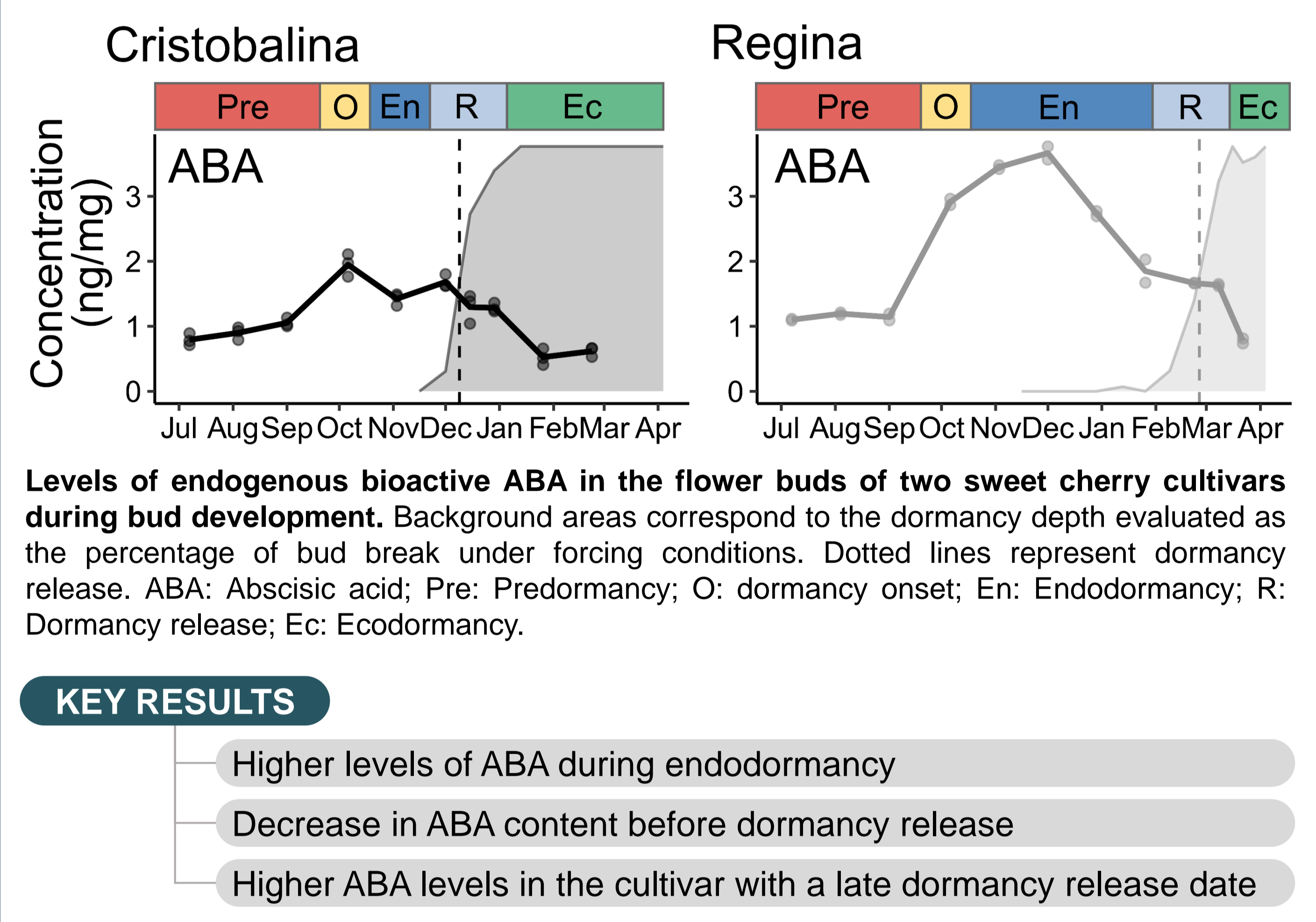
- Physiological observations
- Transcriptional analyses
- Abscisic acid (ABA) quantification
- Predictive modelling approaches

Such integrative approaches will be extremely useful for a better comprehension of complex phenological processes in other perennial species.

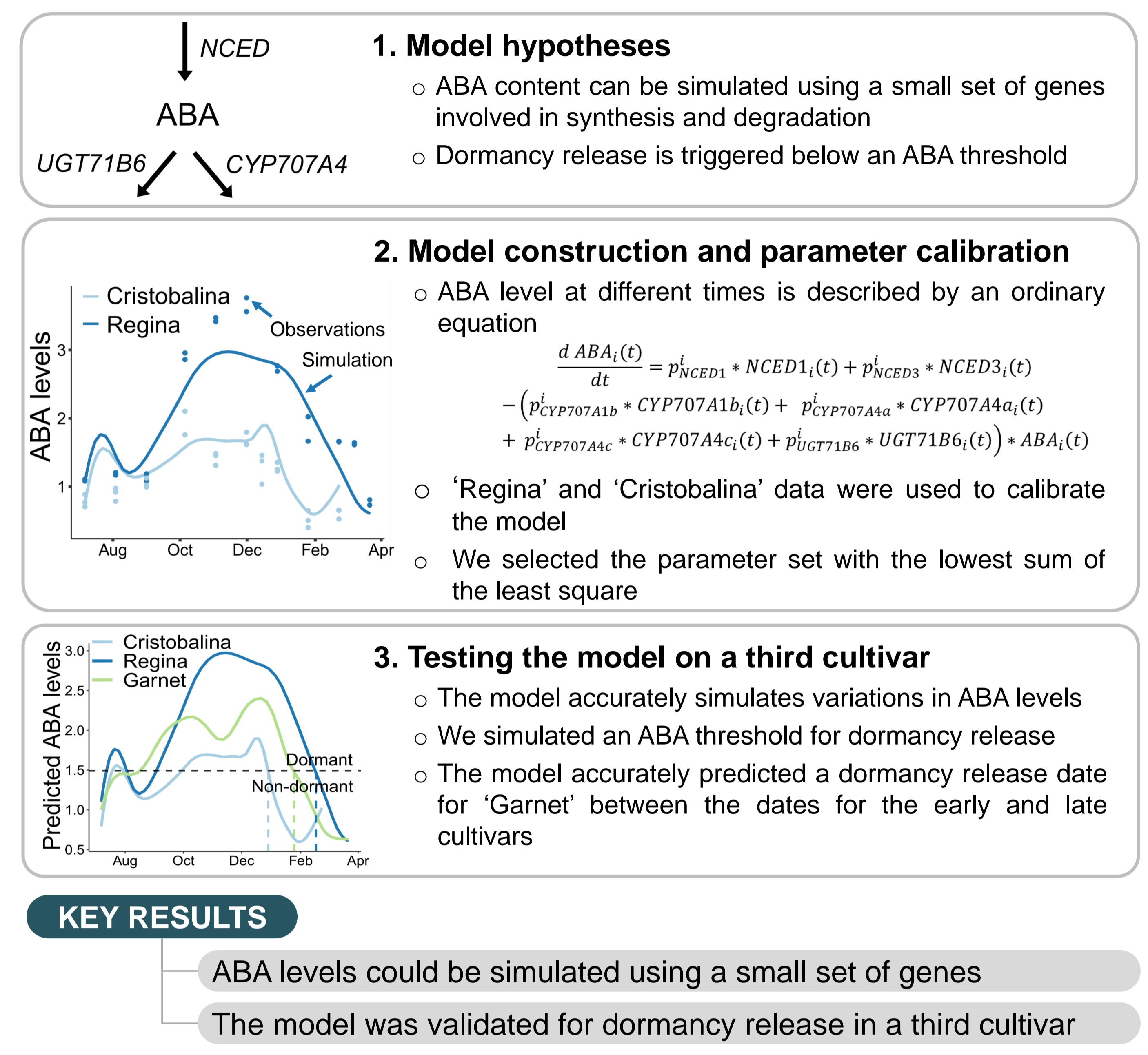
Experimental design



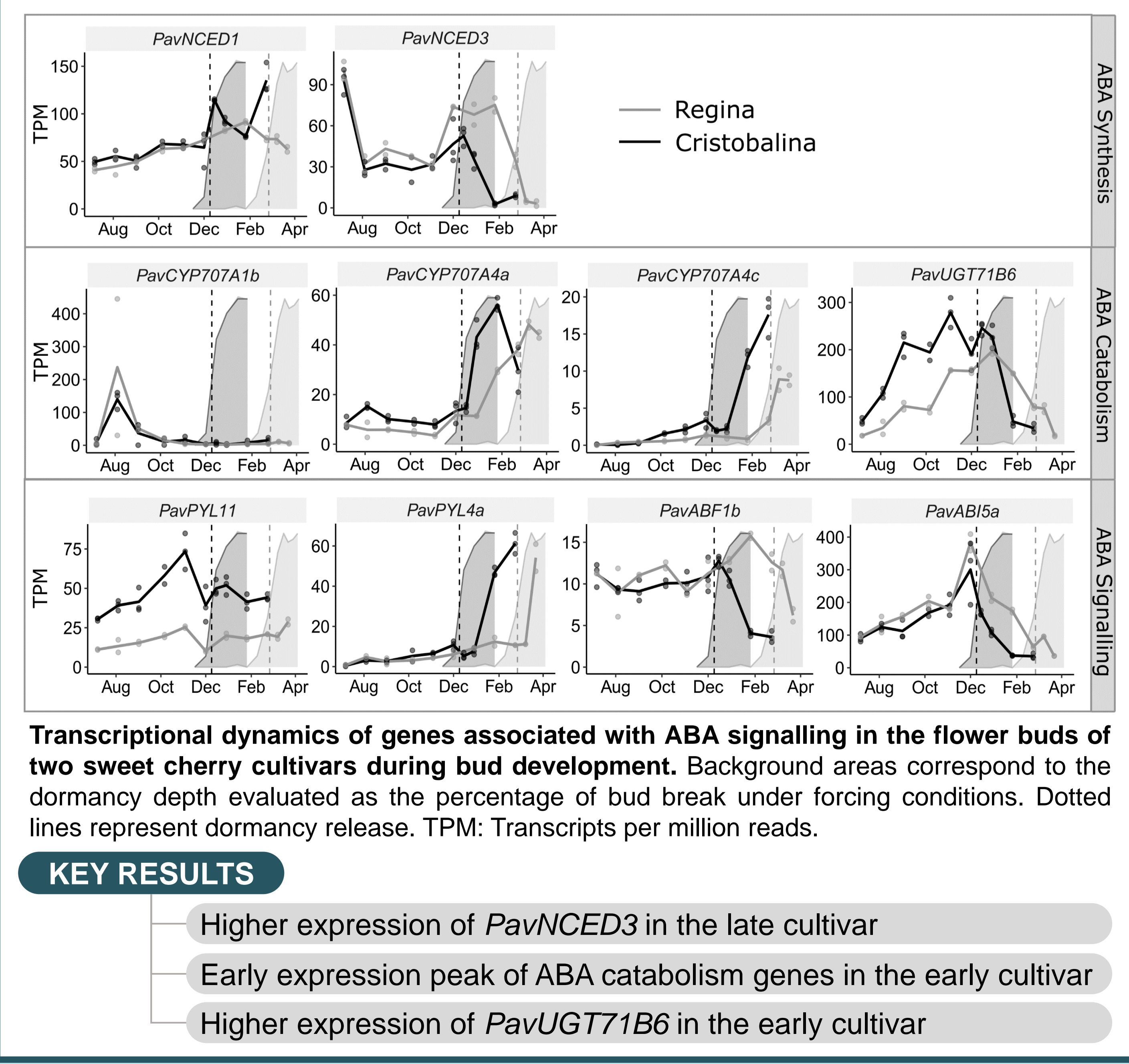
ABA levels are correlated with dormancy status



Modelling ABA levels and dormancy release



Expression pattern of ABA signaling genes



Conclusion

- Following our observations that ABA levels were correlated with dormancy status and that dynamics of expression for ABA synthesis and catabolism may explain the differences observed between cultivars, we have successfully modeled ABA content and dormancy behavior in three cultivars exhibiting contrasted dormancy release dates.
- However, although we could verify the model on dormancy release dates in one independent cultivar, additional experiments with precise ABA levels evaluation will be necessary to validate the actual prediction of ABA levels based on gene expression associated with the dormancy status in 'Garnet'.
- The next steps will be to provide information on temperature-mediated control of the regulatory cascades.

References

Vimont N, Schwarzenberg A, Domijan M, Donkpegn ASL, Beauvieux R, Le Dantec L, et al. Fine Tuning of hormonal signaling is linked to dormancy status in sweet cherry flower buds. *Tree Physiol.* 2020;tpaa122.
 Vimont N, Fouché M, Campoy JA, Tong M, Arkoun M, Yvin J-C, et al. From bud formation to flowering: transcriptomic state defines the cherry developmental phases of sweet cherry bud dormancy. *BMC Genomics.* 2019;20:974.