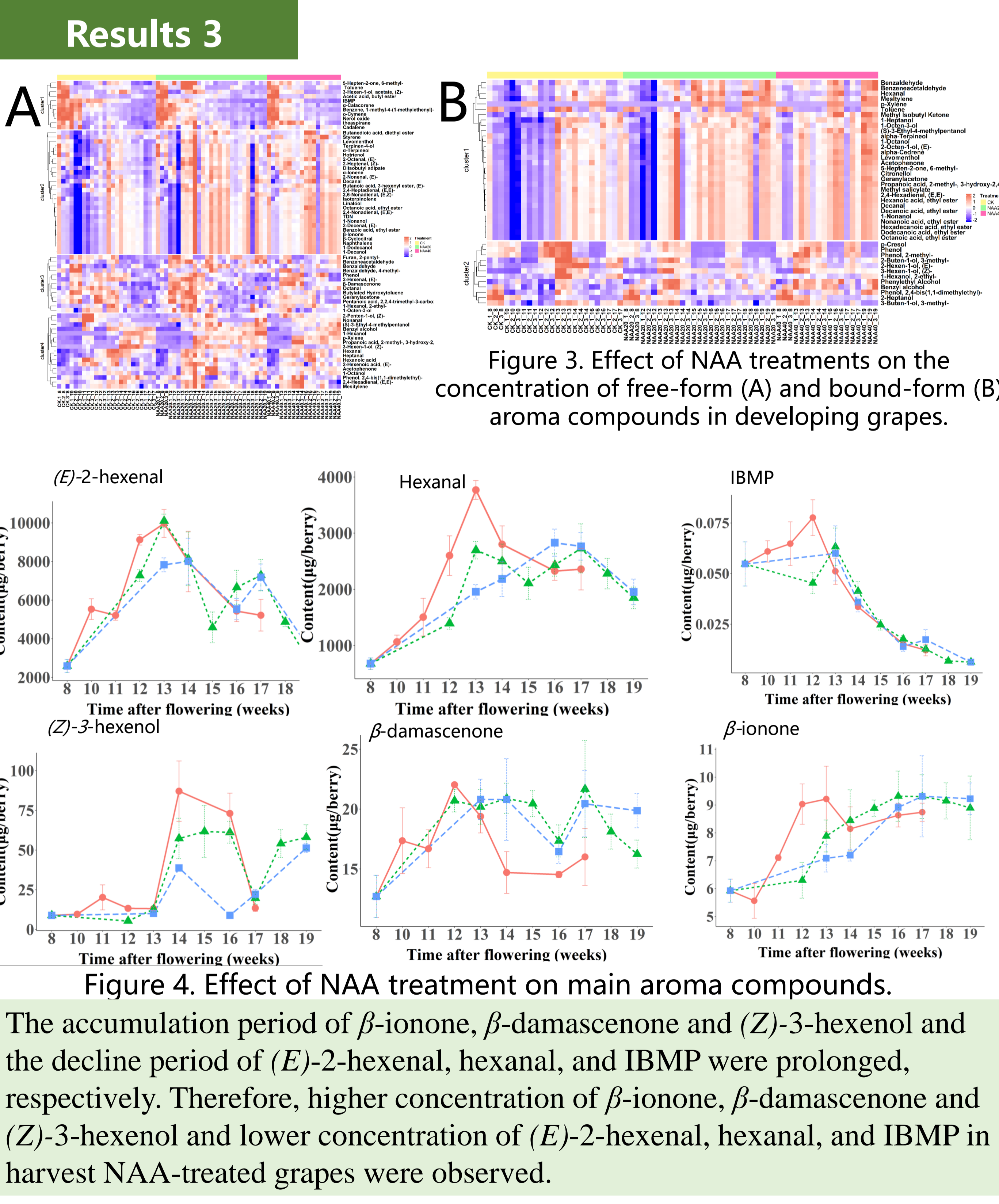
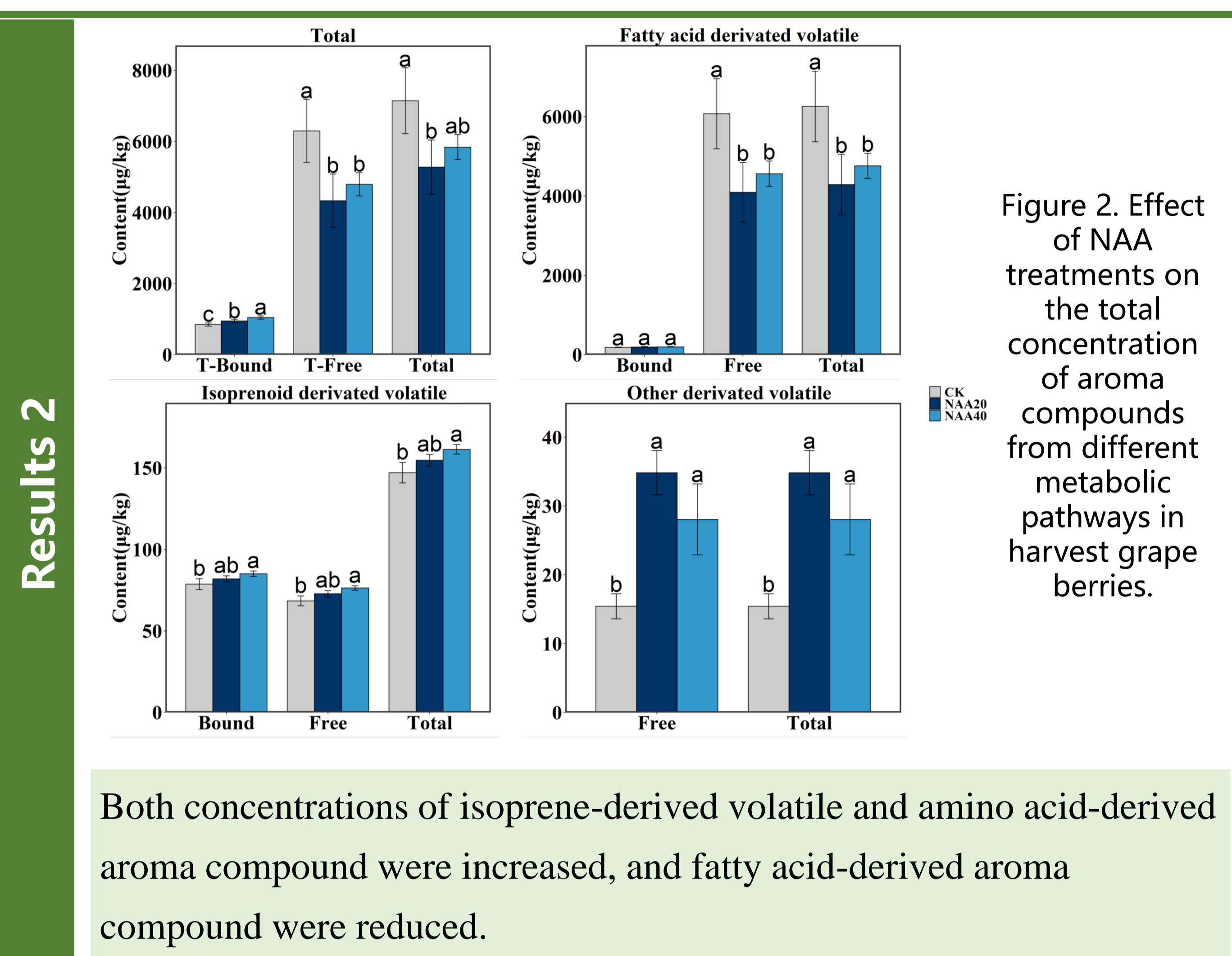
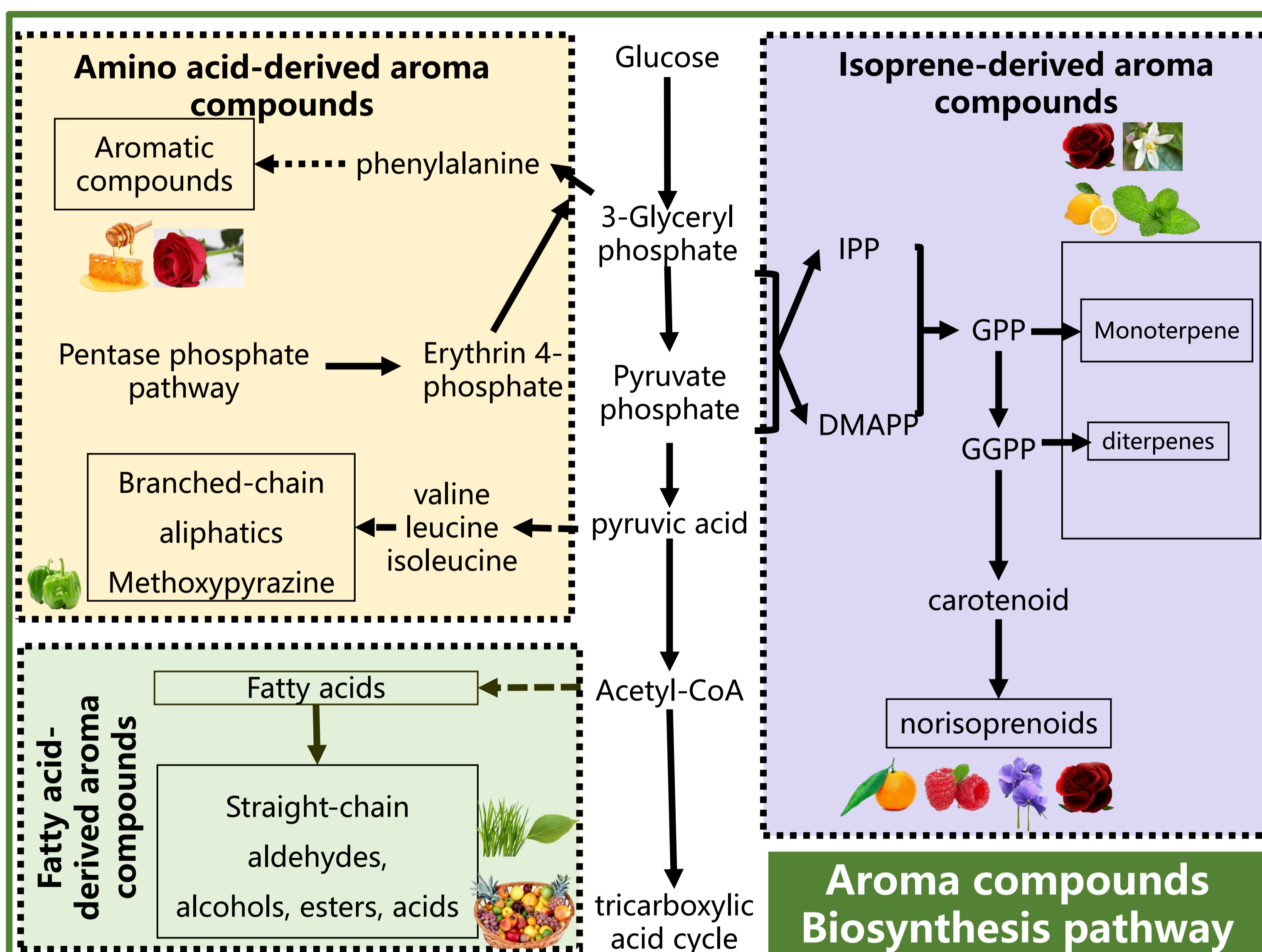


Nong-Yu Xia^{1,2}, Lei He^{1,2}, Qi Sun^{1,2}, Chang-Qing Duan^{1,2}, Qiu-Hong Pan^{1,2*}

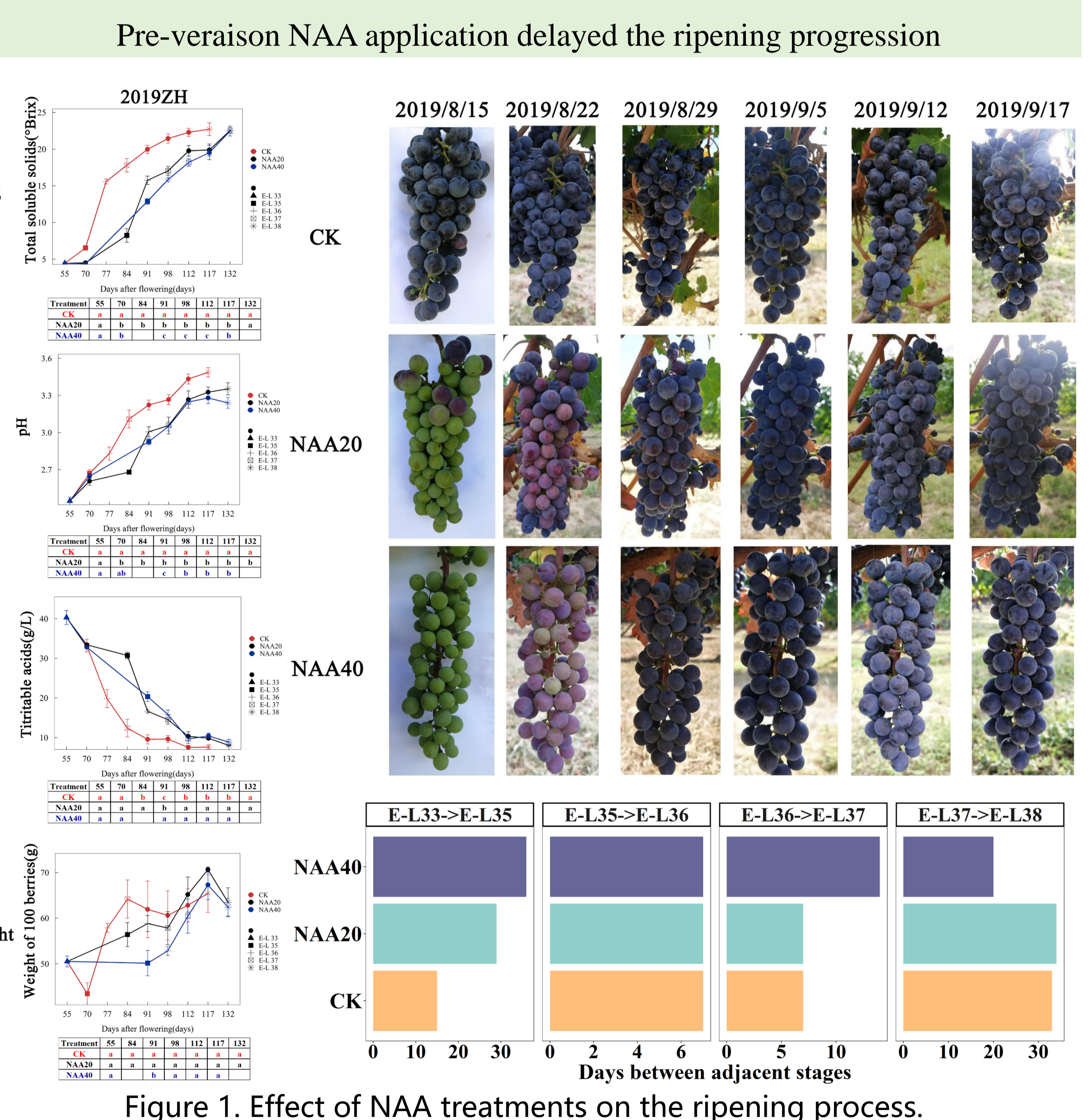
1 College of Food Science and Nutritional Engineering, China Agricultural University, Beijing 100083, China
 2 Key Laboratory of Viticulture and Enology, Ministry of Agriculture and Rural Affairs, Beijing 100083, China
 *Corresponding author Email: panqh@cau.edu.cn

Background

Compared to the eastern regions, the earlier occurrence of grape phenological stages has been observed in the west regions, and in order to let the secondary metabolites such as polyphenols and aroma compounds meet the enological requirement, the grapes are harvested with higher sugar levels and a very different wine typicality than in the eastern regions. In the context of global warming in recent years, the difference between different regions has become more and more evident. To face the possibly negative impact of faster maturation on the grape and wine quality, many viticultural techniques have been developed, including the pre-veraison application of naphthalene acetic acid (NAA), a kind of synthetic auxin. However, the understanding of the effect of NAA on wine grape berry volatile profile remains limited until now. In this study, we investigated the variation of berry maturation process and aroma compounds after 20 and 40 mg/L of NAA spraying at pre-veraison *Vitis vinifera* L. cv. Cabernet Sauvignon grape berries in the commercial vineyard of Ningxia Helan Mountain. The results unveiled the response of various aroma to retarding maturation in a dry-hot wine producing region, which will provide a reference for the implementation of retarding berry maturation in this region and lay a basis for further research on molecular regulatory mechanism.



Results 1



Conclusion

The pre-veraison exogenous NAA application on Cabernet Sauvignon grape clusters could delay the onset of ripening (véraison) and further delayed the harvest, and the higher the NAA treatment concentration, the greater the delaying effect. Both NAA20 and NAA40 treatments prolonged the accumulation of free-form β -ionone, β -damascenone, and (Z)-3-hexenol, and the decline of IBMP, (E)-2-hexenal and hexanal during the ripening. Therefore, the harvest NAA-treated grapes had higher concentration of the important norisoprenoids components (β -ionone and β -damascenone) and lower concentration of green leaf volatiles ((E)-2-hexenal and hexanal). These results suggested that the NAA treatments could reduce the unripen odors such as "green leaves", "green grass", and "green peppers" in the grapes, and could bring more pleasant "flowers", and "fruity" aromas to grape fruits.

Funding

This research was supported by the National Nature Science Foundation of China (Grant No. U20A2042 to C.-Q. D. and 32072513 to Q.-H.P)

