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Tomato is the highest-value vegetable crop worldwide. It contains many essential nutrients and health-promoting compounds, such as sugars, acids and carotenoids. Next-generation sequencing technologies have greatly promoted the application of genome-wide association studies (GWAS) and genomic selection (GS) in crops. GS has shown promising results for tomato quality improvement, resulting of traits difficult to assess. We herein used three GWAS panels that have been phenotyped with main fruit flavour related traits, such as sugars, organic acids and volatiles. Two panels have been genotyped using SNP arrays and the other panel has been genotyped using sequencing technology. We first imputed a much denser SNP sets for the first two panels thanks to the sequences available. We have successfully imputed about 30-folds more SNPs with high imputation quality. Imputation-driven GWAS focusing on malate has confirmed the previous reported significantly associated loci at a higher significance level and also identified new associated loci. We then used the statistical summaries from individual imputation-driven GWASs to conduct a meta-analysis to further validate candidate loci that may not reach the significant level at individual studies. In the next step, we combined results from imputation-driven GWASs and meta-analyses into genomic prediction. We will test the impacts of the number of SNPs, the size of training population and test population on the accuracy of genomic prediction. Our study will deepen our understanding on the complexity of tomato quality and also promote tomato breeding.

x	**Poster presentation**		**Oral presentation**

	SESSION I	MANAGEMENT AND USE OF GENETIC RESOURCES
x	SESSION II	GENOMICS AND BREEDING APPROACHES TO IMPROVE FRUIT QUALITY
	SESSION III	BREEDING STRATEGIES FOR SUSTAINABLE AGRICULTURE –ABIOTIC STRESSES
	SESSION IV	BREEDING STRATEGIES FOR SUSTAINABLE AGRICULTURE –BIOTIC STRESSES
	SESSION V	HOLISTIC APPROACHES TO ENHANCE PLANT AND SEED PRODUCTION

Please, send the abstract as <u>word file</u> to committee.eucarpia2018@gmail.com by February 15, 2018.