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SCIENCES



**Sant'Anna**  
School of Advanced Studies – Pisa

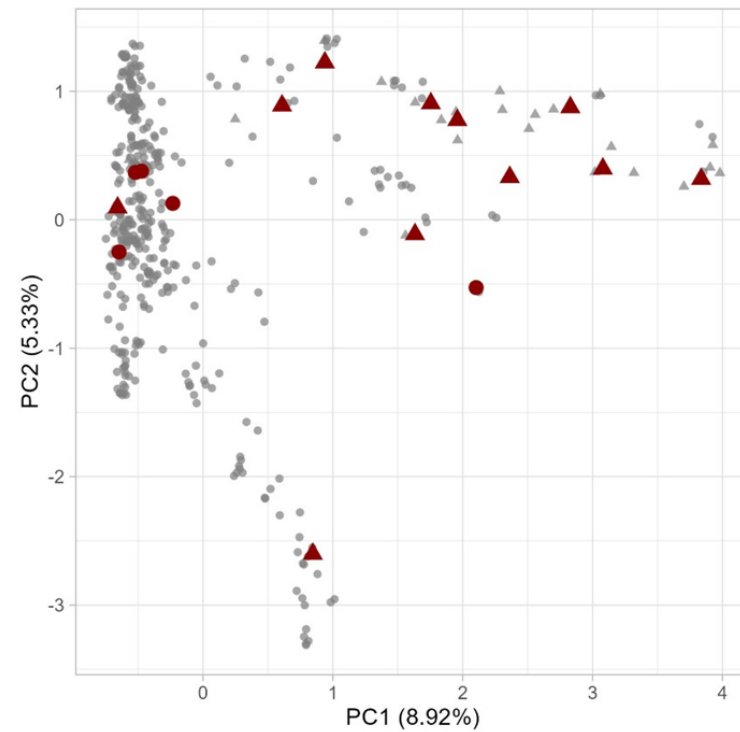
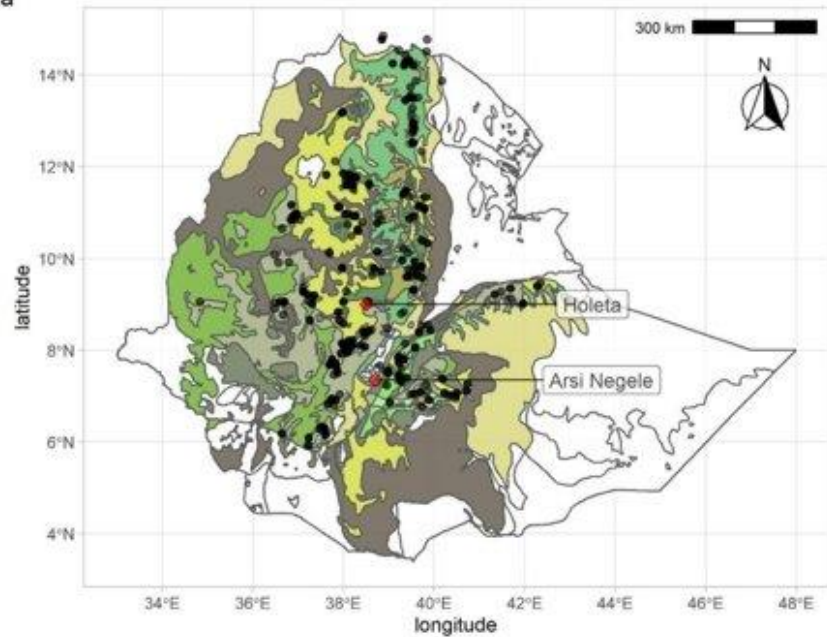
# Genetic Mapping of Photosynthesis Traits in a Multi-parent Advanced Generation Intercross (iMAGIC) Barley Population

BY: Afewerki Yohannes (PhD)

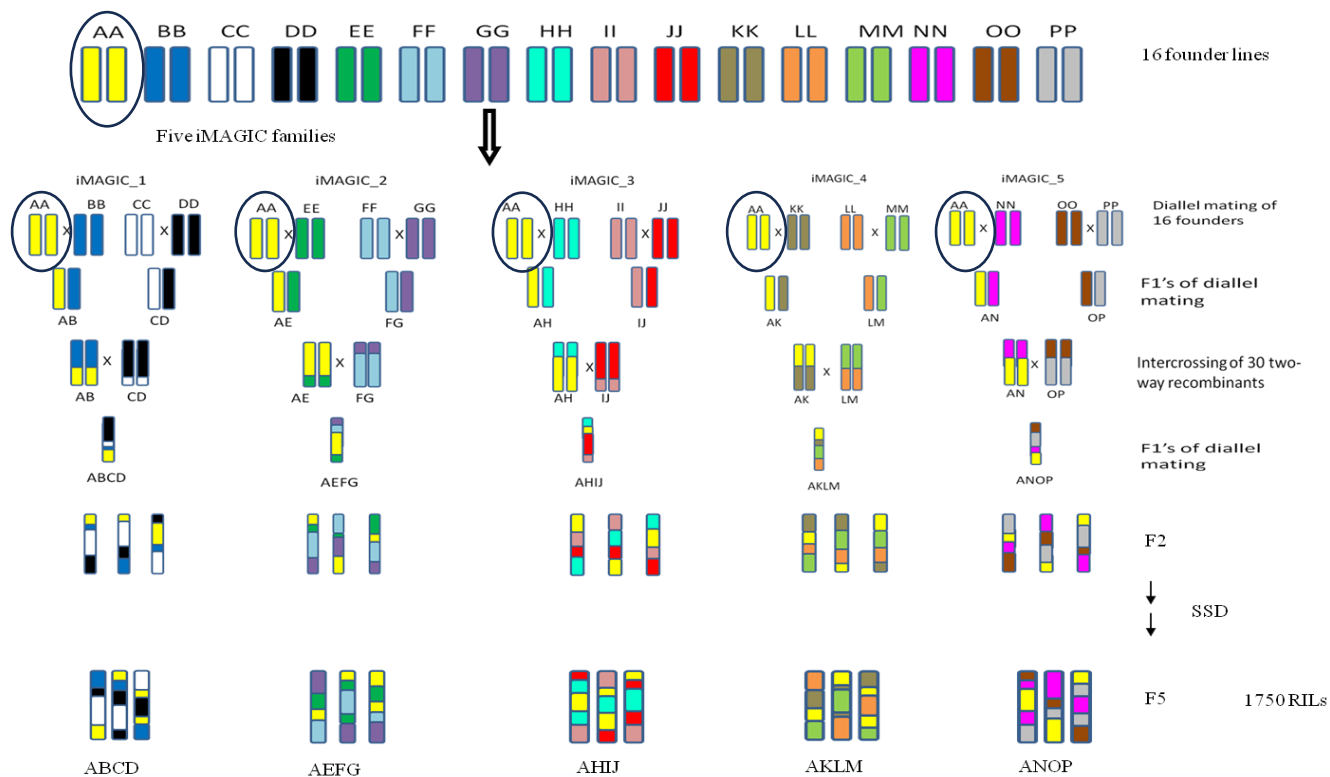


# Parental Line Selection

a



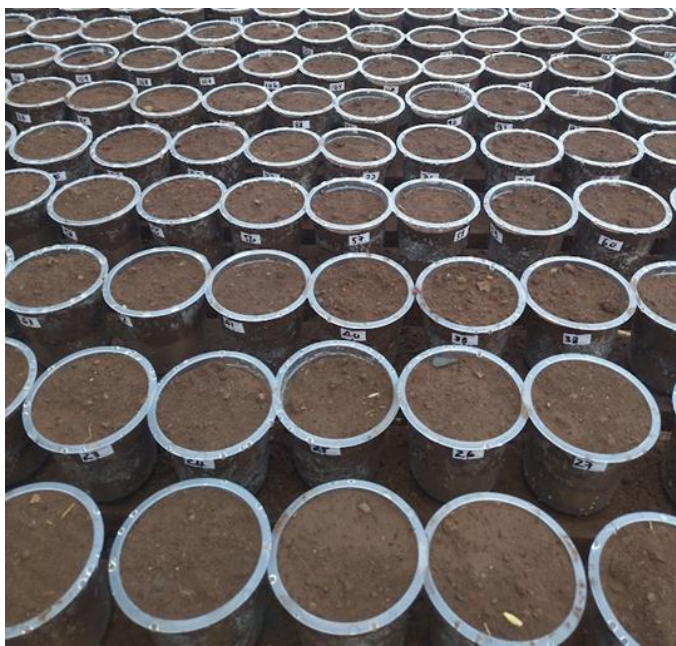
# iMAGIC Population Development



Galaxy A13



## DNA Extraction and Genotyping



- Genotyping was done by GBS (ddRAD-seq)
- 40,464 SNP markers retained after quality control



# Phenotyping

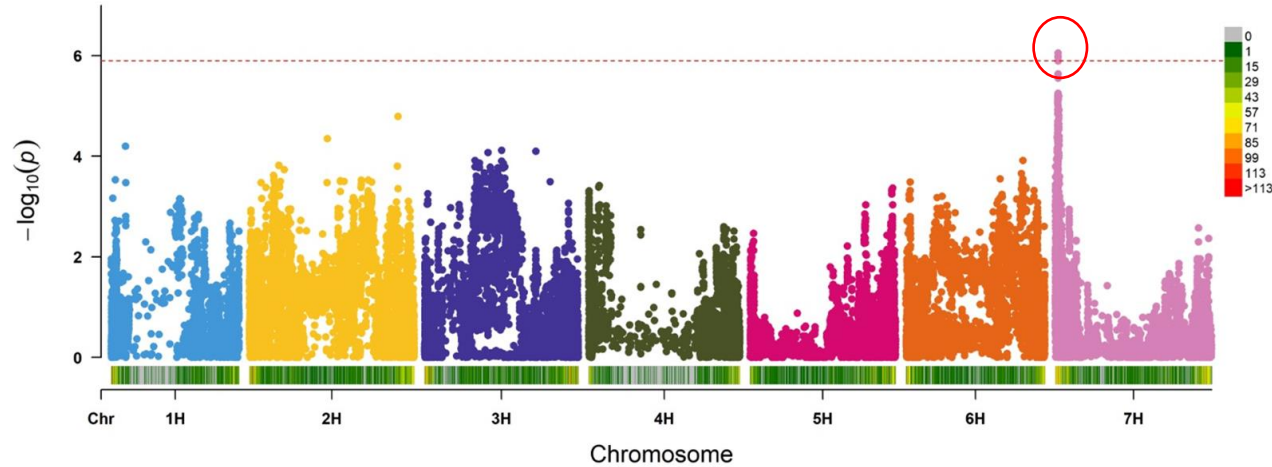


- 516 genotypes in two reps, total 1032 plots (in each of two locations, 2 years in Dabat and 1 in Geregera)
- Standard protocol (RIDES 2.0) on MultispeQ, 1 machine in Geregera and 2 in Dabat
- 5 measurements in each plot
- Measurements between 7AM and 12PM and 1PM to 3PM
- Every day for about 10 days in each run of the experiment



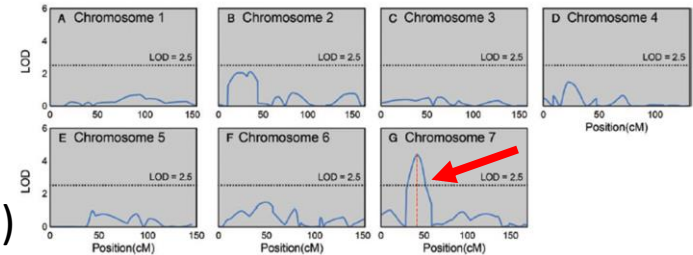


# GWAS for Photosynthesis Efficiency

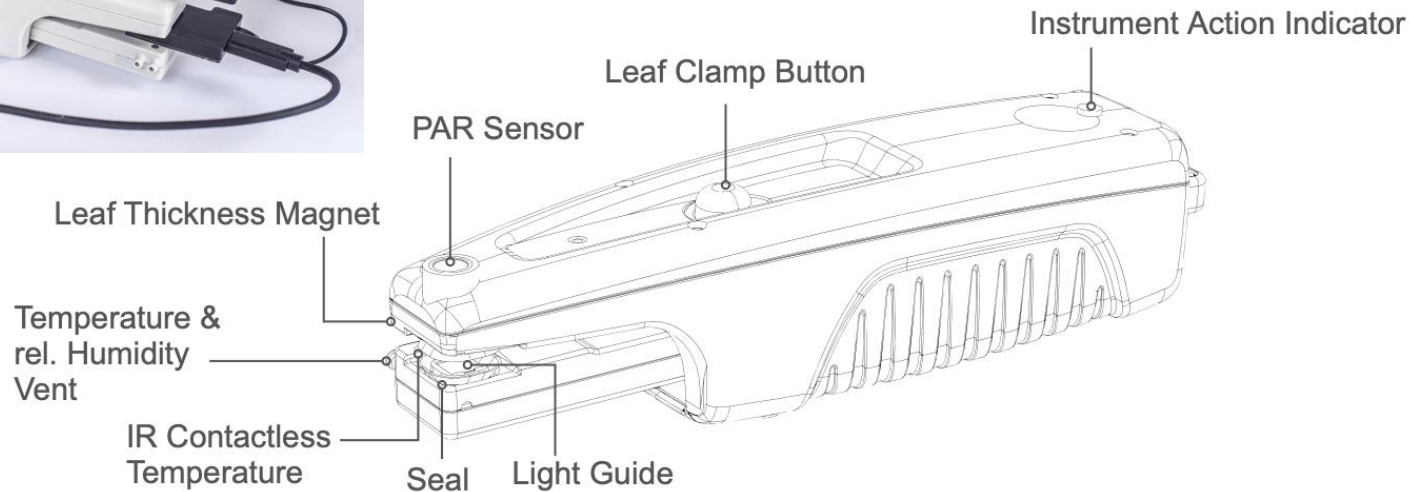


- On chromosome 7H, a QTL for Rubisco activation rate was identified

(Salter et al., 2020)



## Brief Introduction of MultispeQ



## Brief Introduction of MultispeQ



We can collect 32 variables from MultispeQ

| Type         | Parameters  |
|--------------|---|
| Abiotic      | Ambient temperature, relative humidity, atmospheric pressure, leaf temperature, Photosynthetically Active Radiation (PAR) |
| Fluorescence | $\Phi_{II}$ , $\Phi_{NPQ}$ , $\Phi_{NO}$ , LEF, NPQt [ $\Phi$ most of the time written as Phi]                            |
| Absorbance   | Relative Chlorophyll Content (SPAD), ECSt, $vH^+$ , $gH^+$  |





# Getting Started

## Creating an account

1. You can create an account from the **website**, the **desktop app**, or the **mobile app**.  
[https://www.photosynq.org/users/sign\\_in](https://www.photosynq.org/users/sign_in)
2. Create a username and password for your account. This login will be used across the PhotosynQ platform.
3. Check your email for a confirmation. Once you confirm, your account will be been created!
4. Now go back to the website or app and sign in.



[Sign up](#)[Sign in](#)

## Sign in

Email

Password

☐ Remember me

[Sign Up](#)[Sign in](#)

Forgot your password? [Click here to reset](#)

Didn't receive confirmation instructions? [Click here to resend](#)





# Genetic Diversity of iMAGIC population

