Data Analysis of Sorghum Trait Variability

Introduction

This analysis focuses on the variability of sorghum traits under different treatment conditions (HI and LI). This work aimed to clean up and improve a previously cluttered visualization, making it more readable and meaningful. Additionally, key observations were made regarding trait variability, genotype similarities, and the impact of different treatments on specific traits.

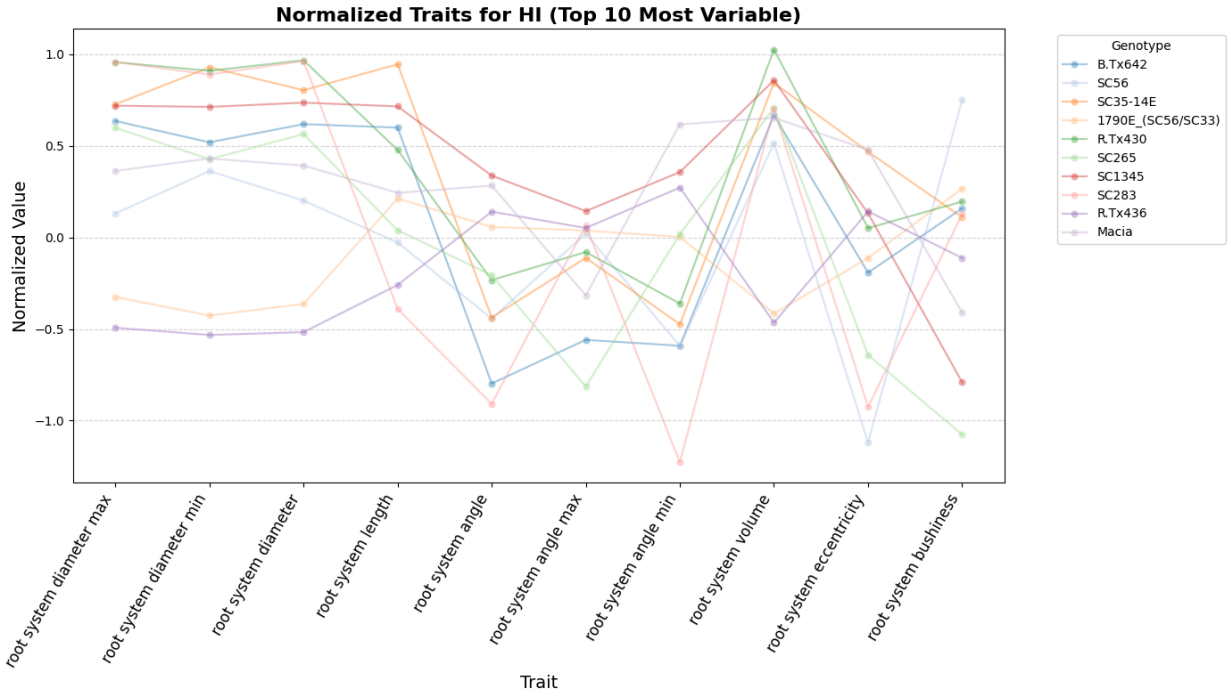
Key Observations

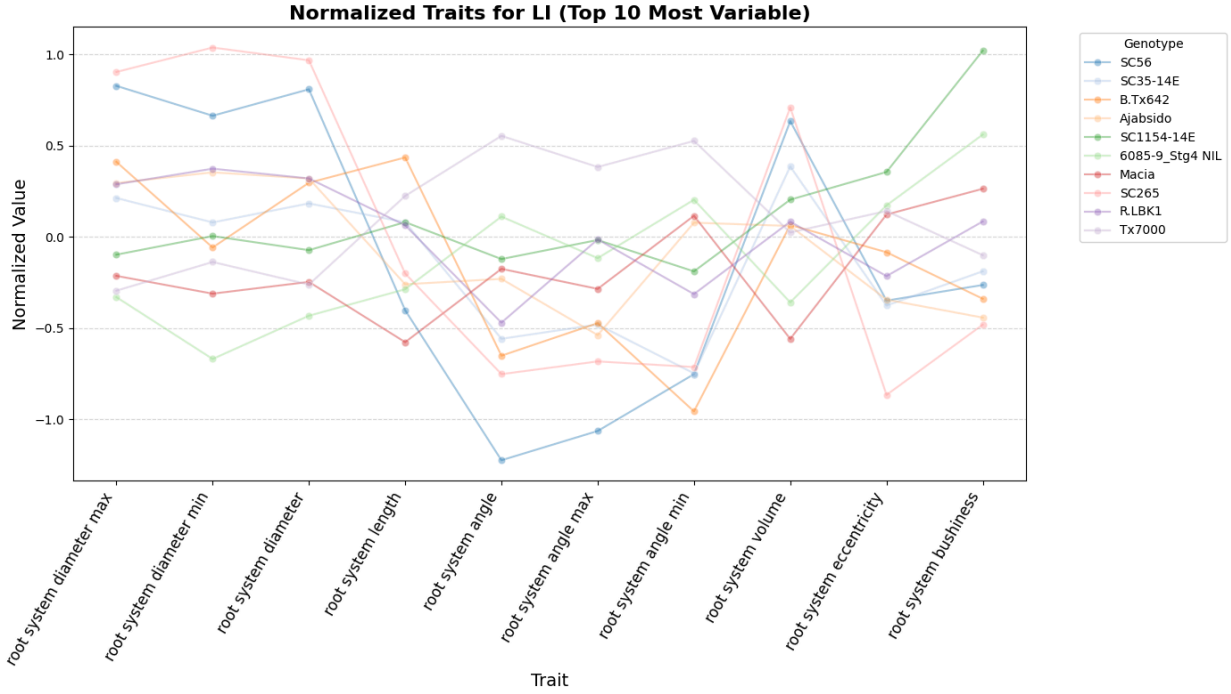
- 1790E and R.Tx436 show highly similar patterns across multiple traits for HI, suggesting a possible genetic relationship or similar response to environmental conditions. Their trait values consistently move together, which distinguishes them from other genotypes.
- HI shows more extreme peaks and valleys than LI, which might suggest that under higher input conditions the genotypes express greater differences in traits.
- LI seems more stable with fewer sharp changes, possibly meaning that low input limits the genetic expression of certain traits.
- Genotypes like SC265 behave very differently across HI and LI treatments
- B.Tx642 appears in both LI and HI plots, which means it is highly variable across treatments
- There is very little heritability between HI and LI for most traits. This could mean that these traits are mostly controlled by genetics rather than the environment.
- Most traits have a high heritability close to 1, reinforcing the idea that the environment plays a less significant role than genetics.
- Root system volume might be more influenced by the environment than everything else.

Conclusion

This analysis highlights how different sorghum genotypes respond to varying treatment conditions. The improved visualization makes these trends clearer, showing that some genotypes maintain consistent behavior across treatments, while others exhibit significant variability.

Graphs


Normalized Traits for HI (Top 10 Most Variable)
Normalized Value
1.0
0.5
0.0
−0.5
−1.0
root system diameter max
root system diameter min
root system diameter
root system length
root system angle
root system angle max
root system angle min
root system volume
root system eccentricity
root system bushiness
Trait
Genotype
B.Tx642
SC56
SC35-14E
1790E_(SC56/SC33)
R.Tx430
SC265
SC1345
SC283
R.Tx436
Macia


Normalized Traits for LI (Top 10 Most Variable)
Normalized Value
1.0
0.5
0.0
−0.5
−1.0
root system diameter max
root system diameter min
root system diameter
root system length
root system angle
root system angle max
root system angle min
root system volume
root system eccentricity
root system bushiness
Trait
Genotype
SC56
SC35-14E
B.Tx642
Ajabsido
SC1154-14E
6085-9_Stg4 NIL
Macia
SC265
R.LBK1
Tx7000