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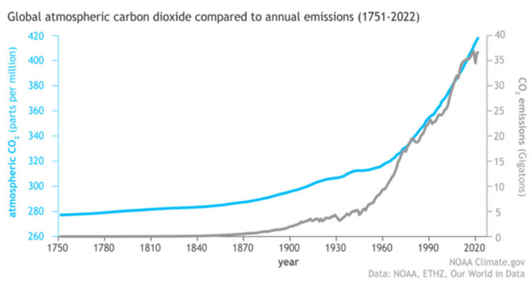
Candidate Genes for Increasing Root Biomass of *Arabidopsis Thaliana*

By identifying genes impacting key plant characteristics we can develop optimized crops with enhanced carbon sequestration capacity to mitigate climate change.

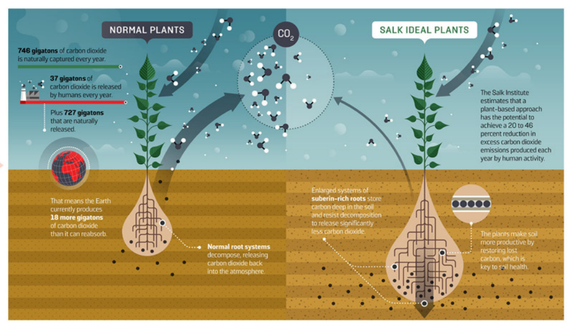
The Problem

1. By 2030, Earth is expected to reach **irreversible climate change** as rising temperatures and weather patterns threaten animals and plants alike.
2. Most CO_2 is a result of fossil fuel burning but other sources include deforestation and food production.
3. **Carbon drawdown** is necessary to reverse devastating effects of climate change and limit global warming to 1.5 °C.



Why Root Biomass?

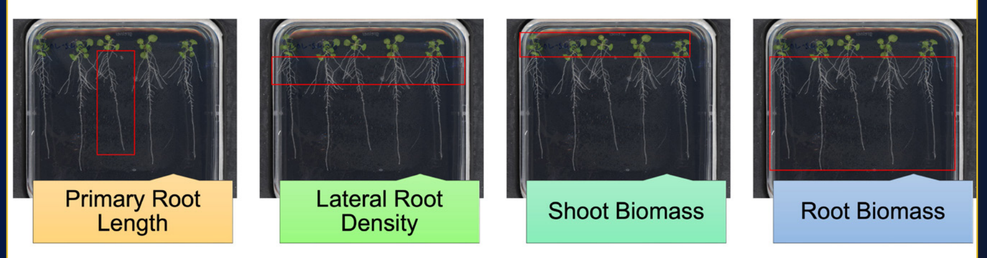
- Increasing root biomass increases carbon sequestration capacity
- Roots provide carbon to soil in the form of root litter and the release of organic material
- Crops with more massive roots can store more carbon deeper extending the carbon cycle (30+ years)
- May increase plant resillience to environmental stress



What genes play a role in root growth and biomass of *Arabidopsis thaliana*?

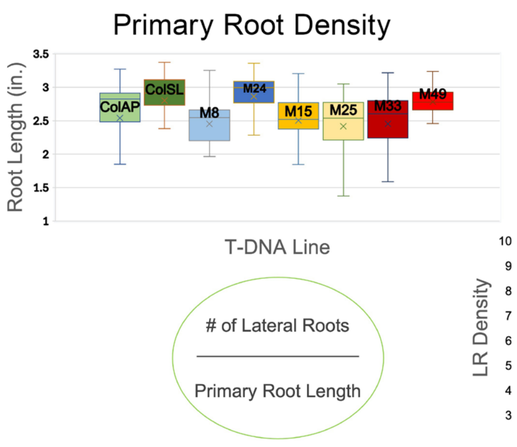
Left: Normal *Arabidopsis thaliana* plant with shallow root system architecture.
Right: Arabidopsis thaliana mutant showing deeper root system architecture. (Roots are colored yellow in the image for better visibility.)
Credit: Salk Institute.

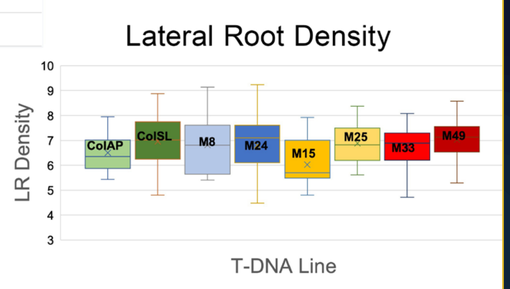
Research Objectives



Results

T-DNA Line	Target Gene
M8 M24	AT1G28630
M15 M25	AT3G11600
M33 M49	AT4G15440





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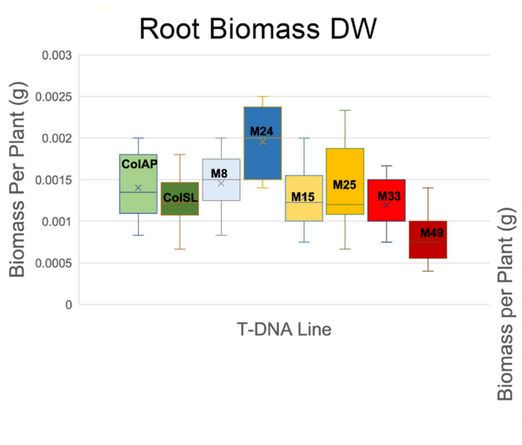

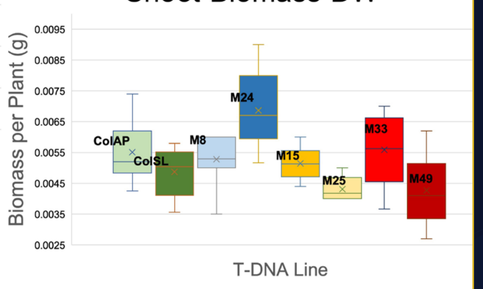

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