

RATIONALE

- To meet global food demand, it is essential to improve crop and livestock productivity in agroecosystems frequently affected by abiotic stresses and those which are prone to adverse effect of climate change. Problems associated with consumption of water and fertilizer needs to be solved to ensure eco-efficiency. Agricultural research interventions aiming at Water Use Efficiency (WUE) and Nitrogen Use Efficiency (NUE) of crop and forage components need to be explored and implemented to accomplish the task.
- The recent advances in molecular biology have generated more hopes to overcome abiotic constraints as techniques and tools are more robust now than ever before to further explore the genome with greater efficiency and with increasing pace. However, understanding the genome function and its application for crop and forage improvement is the bottle neck. Hence phenomics is crucial to realize the benefits of advanced biological knowledge for sustaining ecosystems while enhancing crop and livestock production in the tropics. CIAT researchers are improving the phenotyping capabilities to improve eco-efficiency of its mandated crop and forage components. Here we show the recent advances in phenotyping rice as a case study.

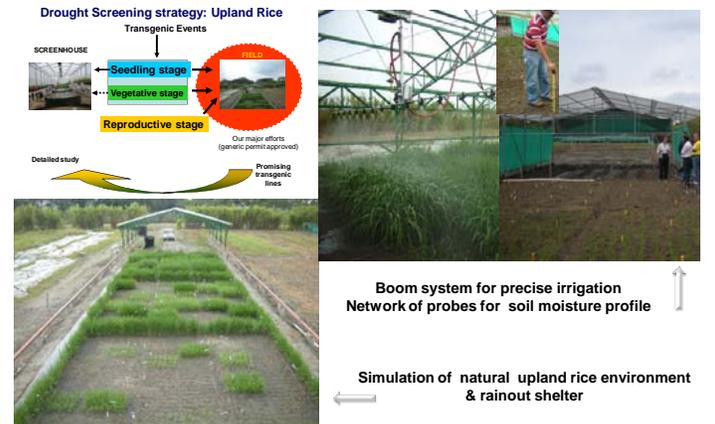
OBJECTIVES

- To facilitate high throughput phenotyping under field and controlled environment with
 - Automation, improved precision, efficient management of stress environment
 - Precision in characterizing plant responses and growth environment
 - Accessible noninvasive advanced instruments and methods
- To facilitate development of agronomic ally superior crop variety with a stack of
 - Desirable genes associated with traits
 - Traits associated with abiotic stress tolerance

TARGET TRAITS AND CROPS

Traits	Water Use Efficiency	Nitrogen Use Efficiency	High Temperature Tolerance	Acid Soil Tolerance
Bean	✓✓✓		✓	✓✓
Cassava	✓✓✓		✓	
Forage (Brachiaria)	✓✓	✓✓		✓✓✓
Rice	✓✓✓	✓✓✓	✓✓	

SCALED UP CAPABILITIES TO EVALUATE GENE TECHNOLOGY IN RICE



VISUALIZED PHENOTYPING PLATFORM

