Crop Improvement by Methylome Remodeling of *Saccharum Officinarum*

A. Stoute, R. Worrel, L. Waterman

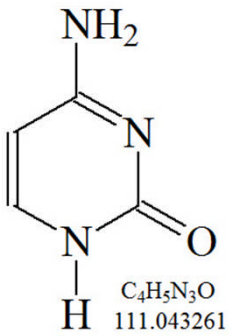
Methylation

Types of methylation

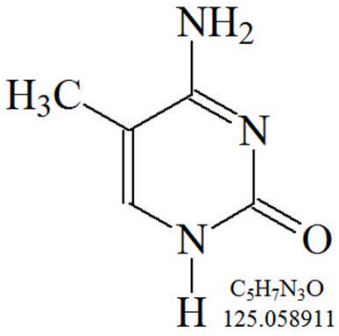
CG

CHG

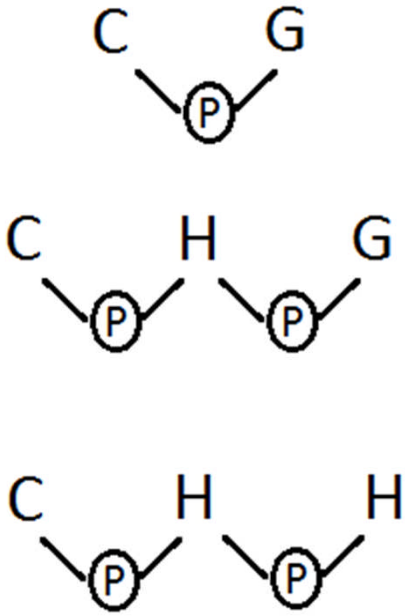
CHH



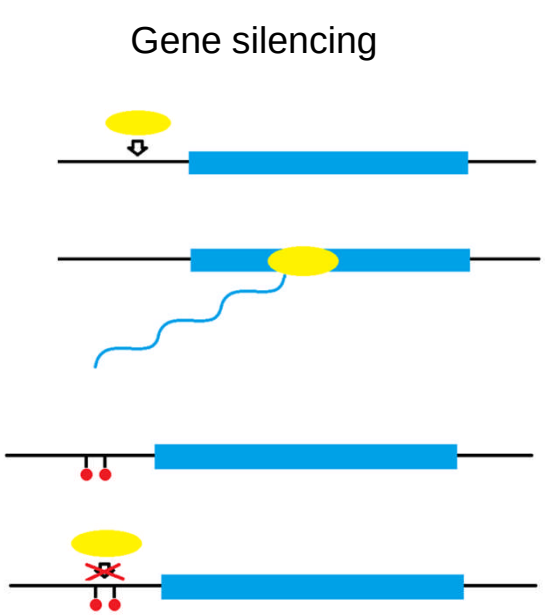
Cytosine

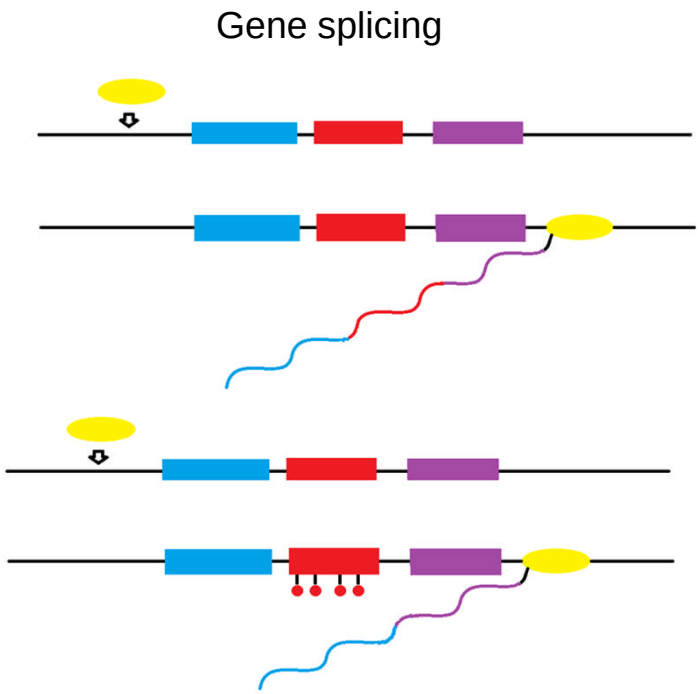


5-Methylcytosine



What methylation does





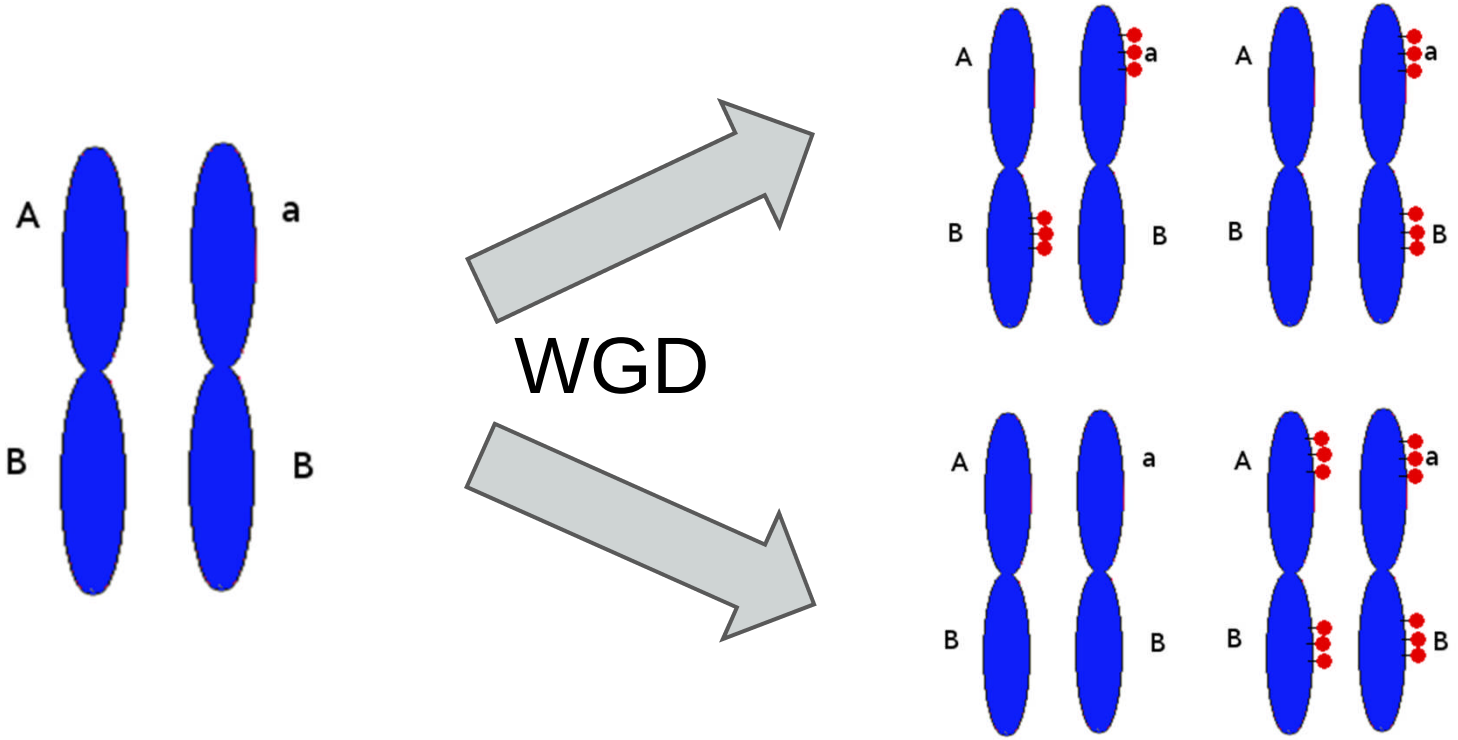
- Transposons
- VIGS

Inheritance

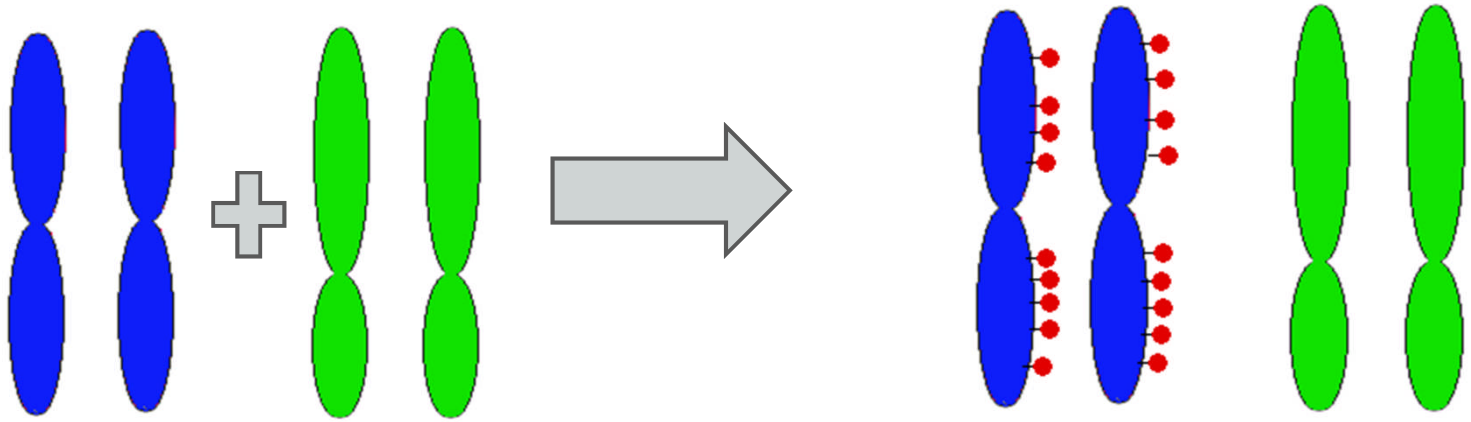


Methylation states can be inherited

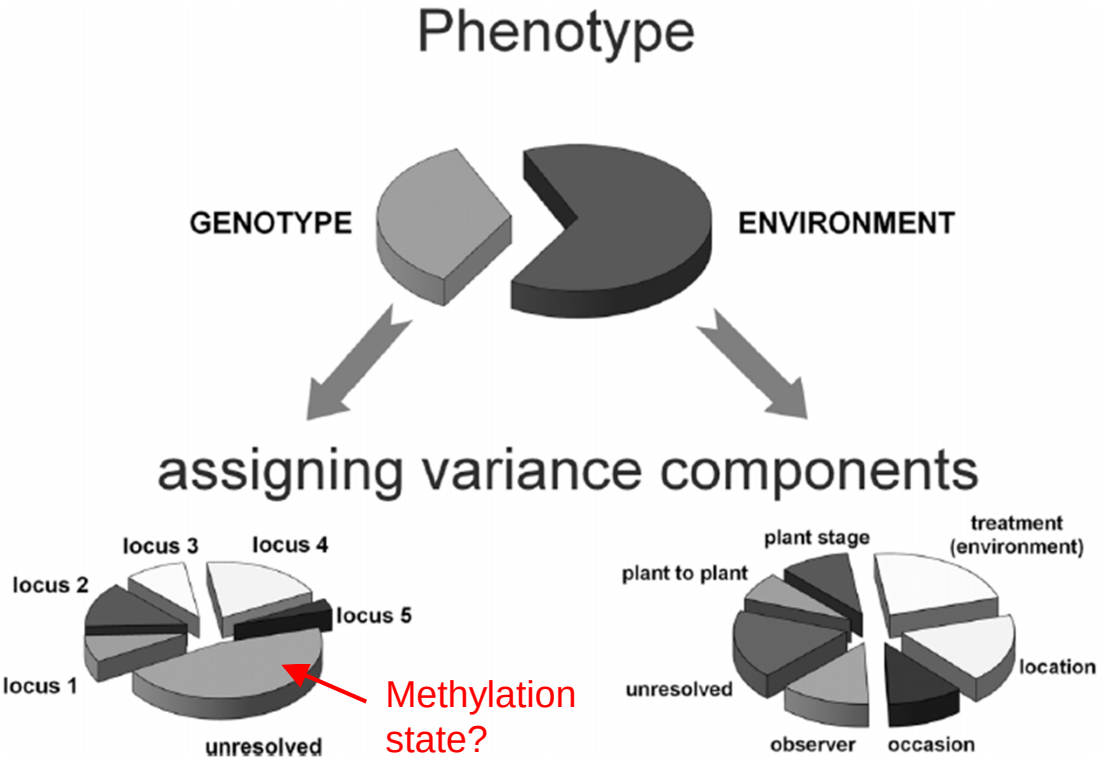
Polyploidy and methylation



Alloploidy



Phenotypic changes



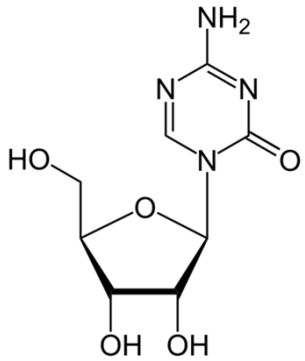
King et al 2010

The methylome

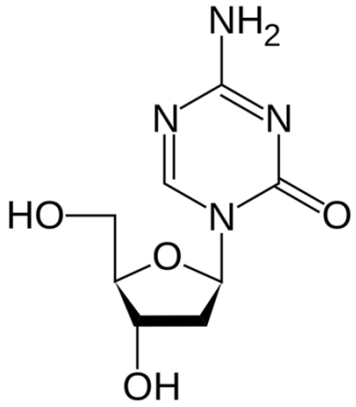
Is there untapped allelic potential in Sugarcane?

Changing the methylome

Chemicals (DMAs) - Azacitidine (Aza) and Decitabine (Dac)



Azacitidine



Decitabine

Our proposal

2 approaches

Seeds

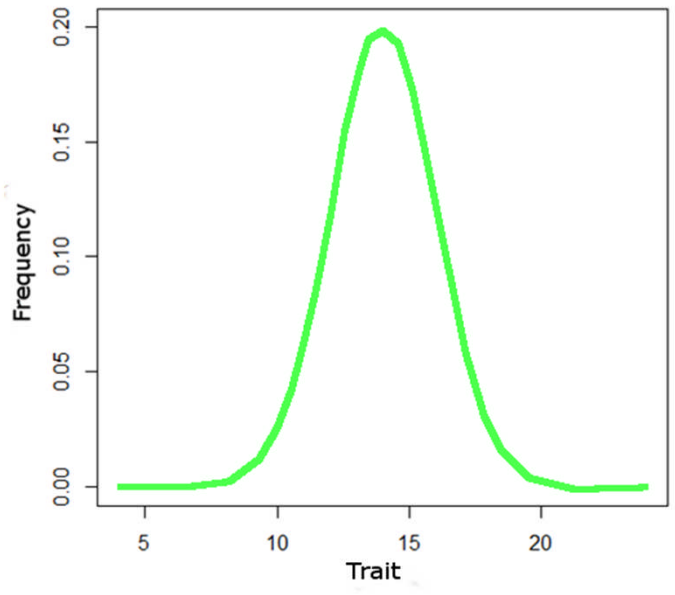
Tissue culture

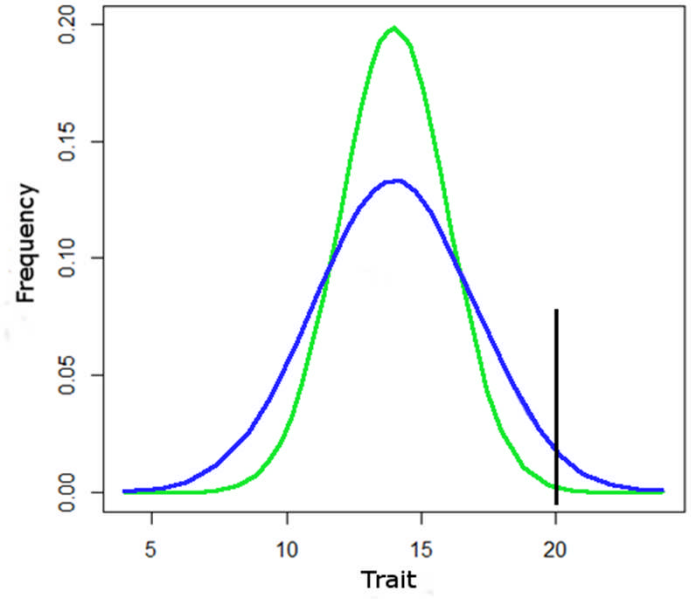
Seeds

Treatment of seeds - imbibed on 1.5mM AZA or DAC

Testing increased variation in a population

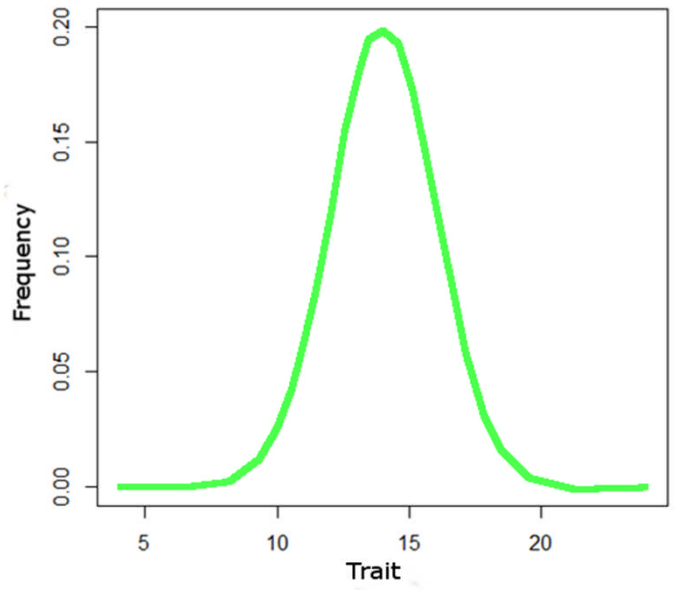
Seedling populations

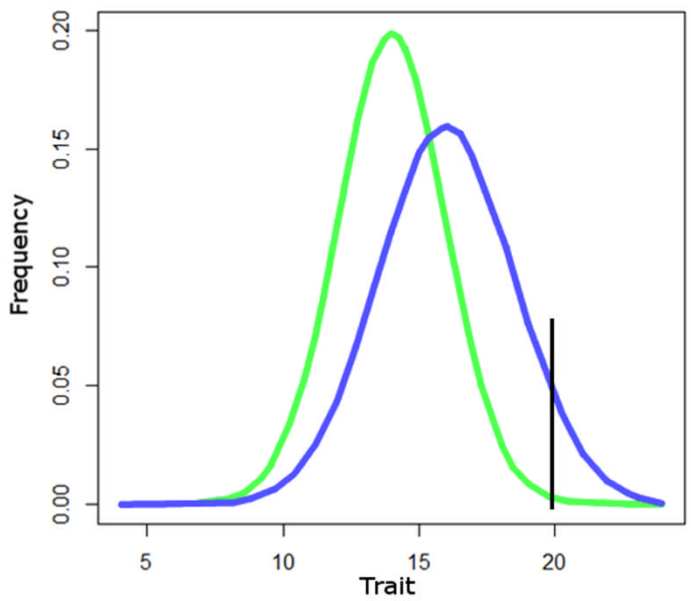




Tissue culture lines

80uM Aza, 50uM Dac





Progress to date

Established a field trial of putative demethylated seed - Planted Jan 2015

In the process of regenerating DMA treated plants from tissue culture - to be planted Sept to Dec 2015

Trialling ms-AFLP as a mean for evaluating successfully changes in methylation





Thank you







ACP-SRP