

Data-driven apple breeding in the Annapolis Valley

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How can we use genetic data to improve fruit?



Gaspereau Valley, Nova Scotia

Marker-assisted breeding



New York Muscat
Aa

X



L'Acadie Blanc
aa



50% Aa

~~50% aa~~



Genetic mapping

DNA

Traits



Genotype

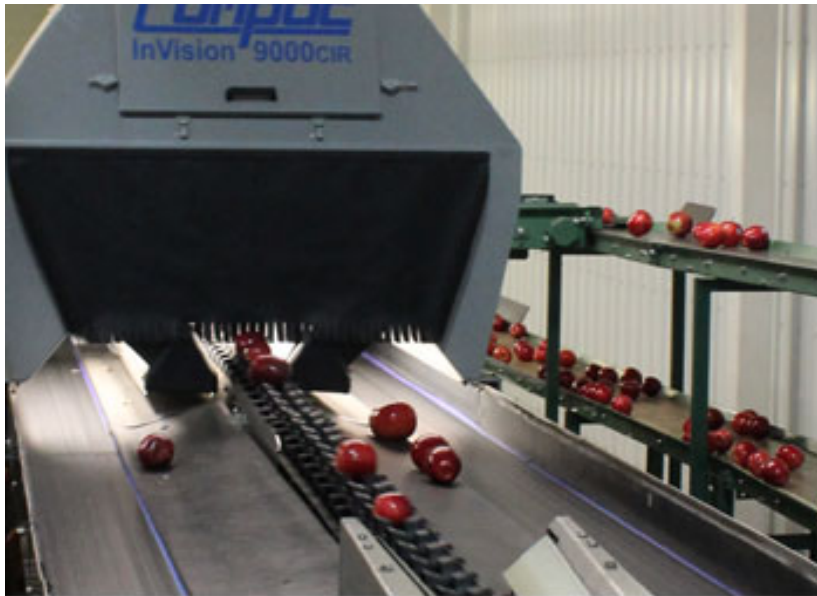
Phenotype

ABC: Apple Biodiversity Collection

Over 1000 diverse apple varieties



Automated Fruit Evaluation

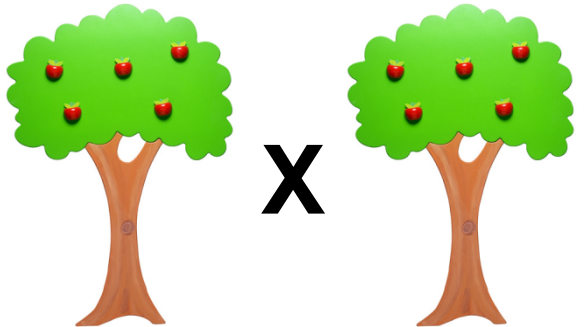


Non-destructive
Traits: colour, weight,
shape, density,
blemishes

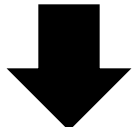


Destructive
Traits: sugar, acid,
solid/liquid ratio

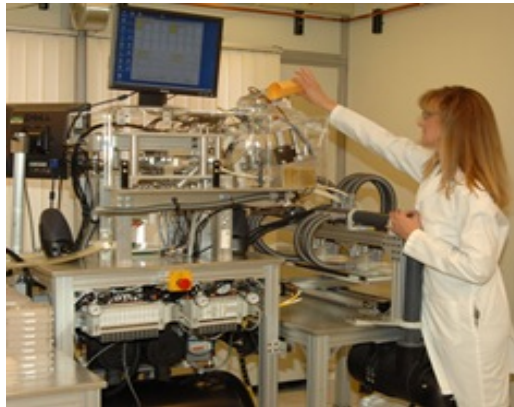
Fruit breeding in the future



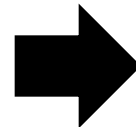
Breeder selects parents
based on DNA



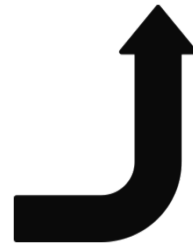
100,000+ seeds



Seed chipping



DNA extraction



Analysis and prediction

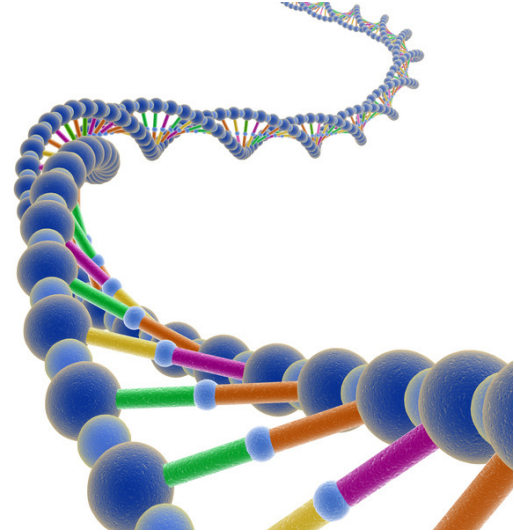
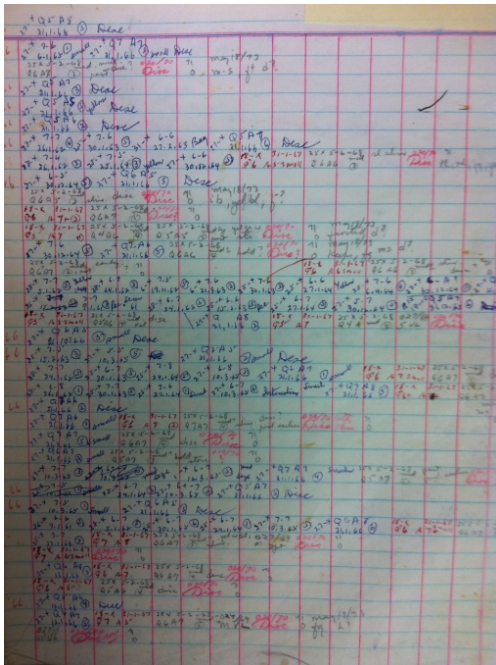


100 seeds
back to breeder



1 week

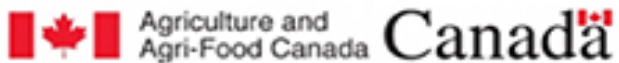
Breeding a better future





Thank you

cultivatingdiversity.org
@foodimprover



GenomeCanada



Nova Scotia Research
and Innovation Trust



NSERC
CRSNG



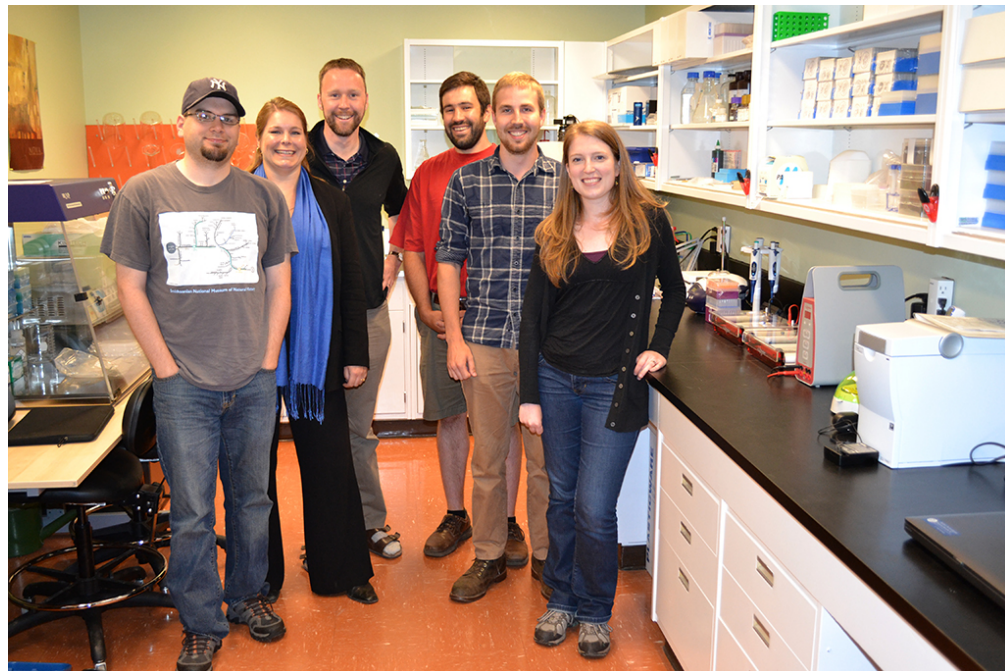
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The Wenner-Gren Foundation



The Lab