

Precision Agriculture: Green Revolution 2.0



Presented by:
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Norman Borlaug (1914-2009)

Father of the Green Revolution



- Developed multiline wheat varieties to increase disease resistance in Mexico
- Crossed dwarf cultivars with disease resistant cultivars to produce wheat varieties adapted to tropical and subtropical climates

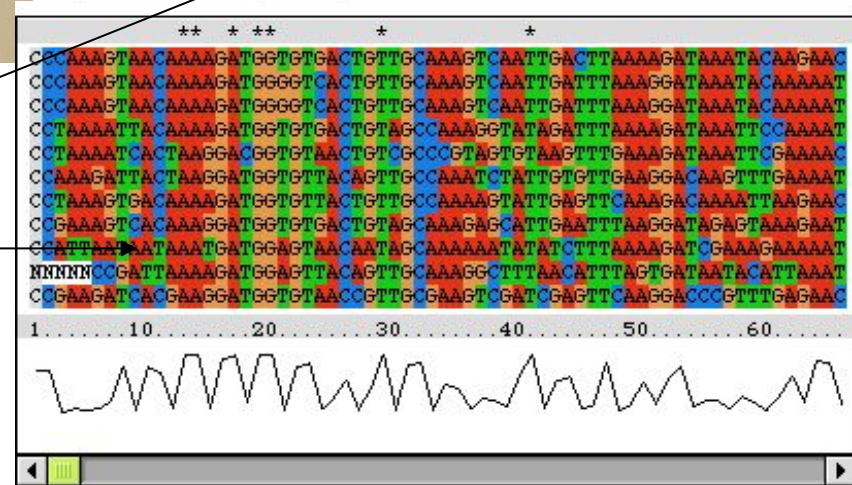
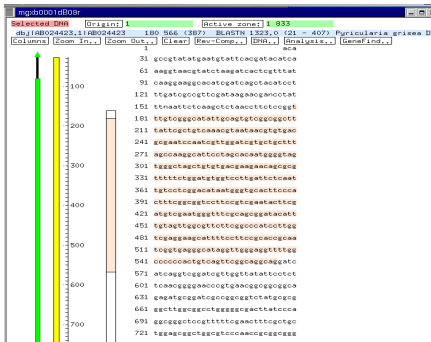
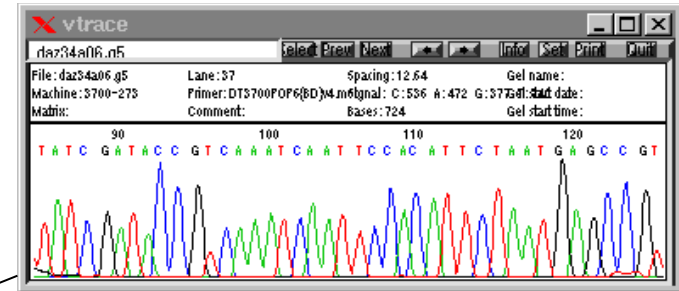


Home Computing Introduced: 1981



<https://en.wikipedia.org/wiki/ZX81>

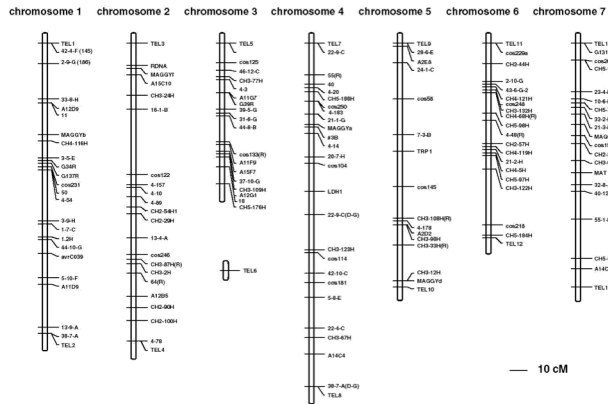
2002 High throughput Sequencing



High throughput Sequence reads from ABI 3730



2002: Rice Blast fungus integrated physical/genetic map is published



STATE UNIVERSITY

Chromosome 1

PHYSICAL MAP

2-9-G
33-8-H
11
A12D9
pLF32-5-E
40-10-D
G34R
4-163
50
G137R
4-54
3-9-H
CH5-131-H
1-7-C
CH5-120H

Note:
Gaps represent ends of contigs.
The actual length of the DNA
between contigs is currently
unknown, so the "gaps" may
actually be "negative" gaps,
i.e. some contigs may overlap.

GENETIC MAP

Tel 1
2-9-G
33-8-H
11
A12D9
pLF32-5-E
40-10-D
G34R
4-163
50
G137R
4-54
3-9-H
CH5-131-H
1-7-C

Click contigs to see
detailed maps. Click
markers to see marker
data.

Scale bar

Martin, et. al. 2002: "MagnaportheDB: a federated solution for integrating physical and genetic map data with BAC end derived sequences for the rice blast fungus *Magnaporthe grisea*." *Nucleic Acids Research Vol 30. No.1* 121-124





2009: Green Revolution v 2.0

Big Data Analytics will drive:



Vertical Farms



Robotic Technology



Genetic Engineering



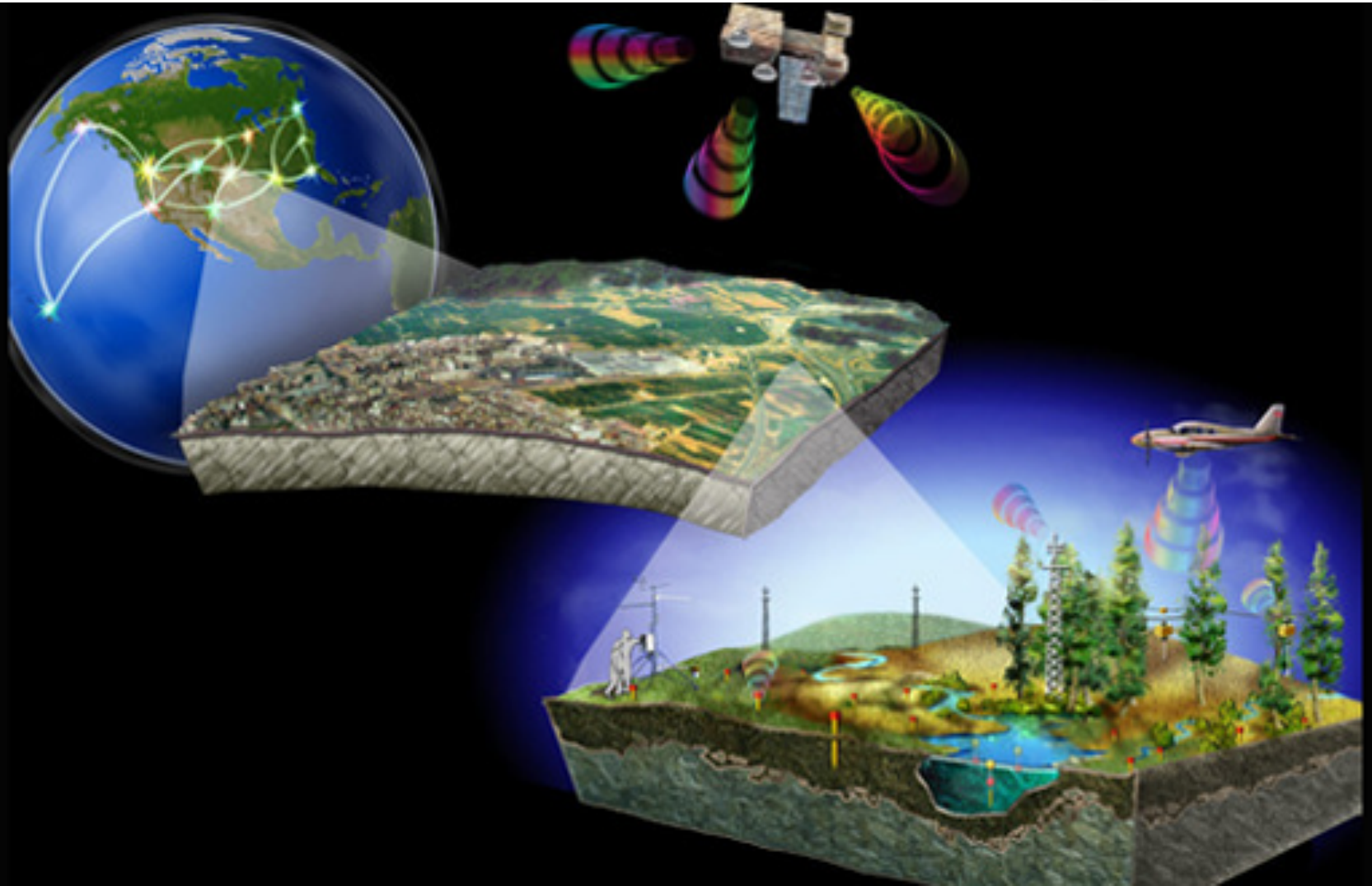
...the charge is clear. We have to develop crops that can grow in a drought, survive in a flood, resist pests and disease, higher yield on the same land. – Bill Gates, October 15, 2009

World Food Prize Symposium, Des Moines, Iowa

2015: Precision Ag 101



2017: Ag moves to space



2018: MARSAG Founded



MARSAGRICULTURAL RESEARCH CONSORTIUM

The Mars Agricultural Research Consortium is an organization whose members include businesses, academic institutions, and government agencies. The consortium exists to promote the peaceful and cooperative development of technologies necessary for the production of edible food on Mars.

2019? The Future is up to us

