Plant Breeding   =   Fantastic Possibilities!
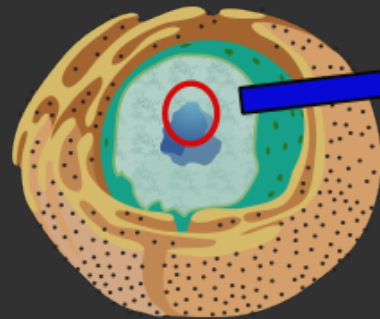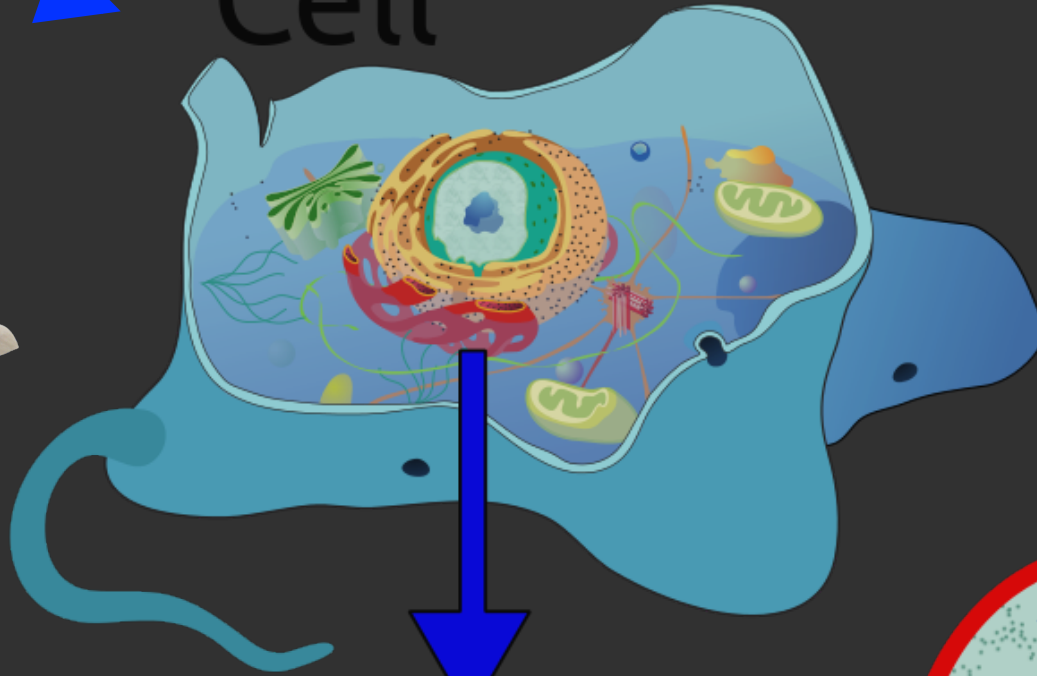

Credit: Tyrone Spady and John Lieu

Teosinte vs. maize

Credit: The International Maize and Wheat Improvement Center (CIMMYT)

Lisa Kissing Kucek - Cornell University
lkk26@cornell.edu

Organism

Cell

DNA

Nucleus

Chromosome

DNA

RNA
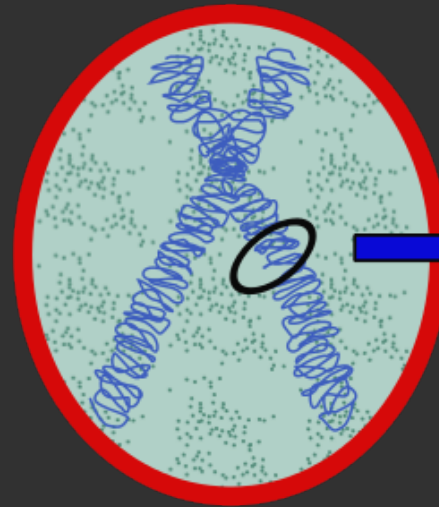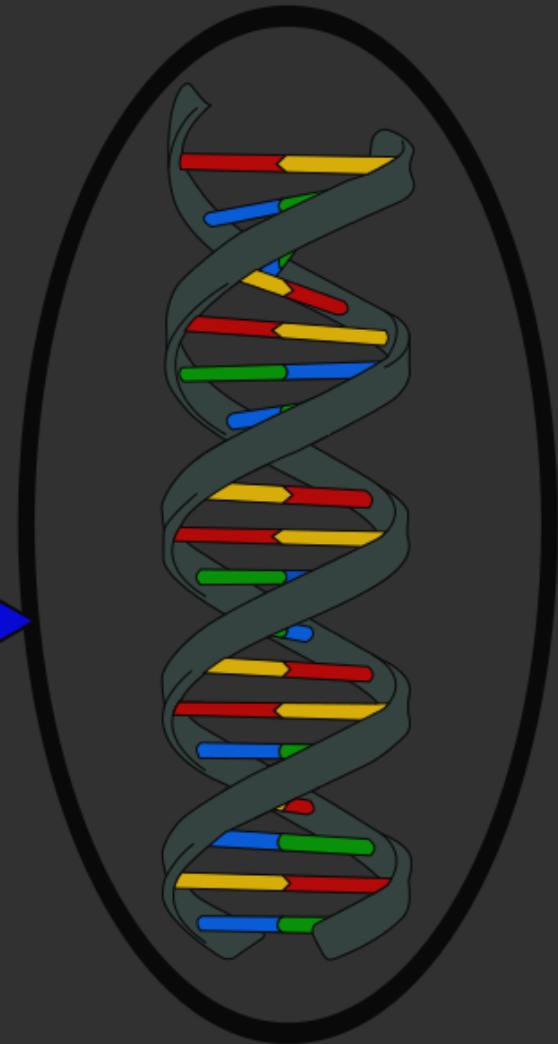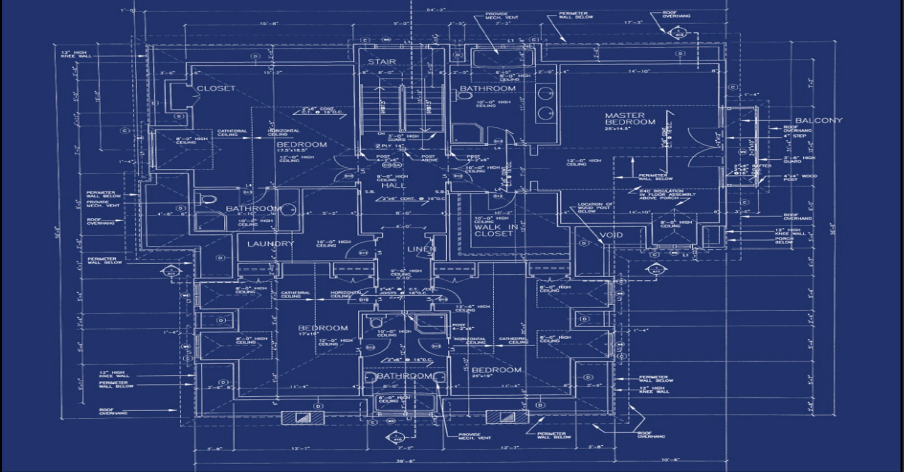
Proteins

Organism

www.urbansamurai.com

phoenixtesting.com

www.kcestructural.com

http://www.doschdesign.com/products/3d/Building_Materials_Vol_2.html

GOAL

Anther holds **pollen** with ½ of the DNA

Pistil

Ovary contains **eggs** with ½ of the DNA
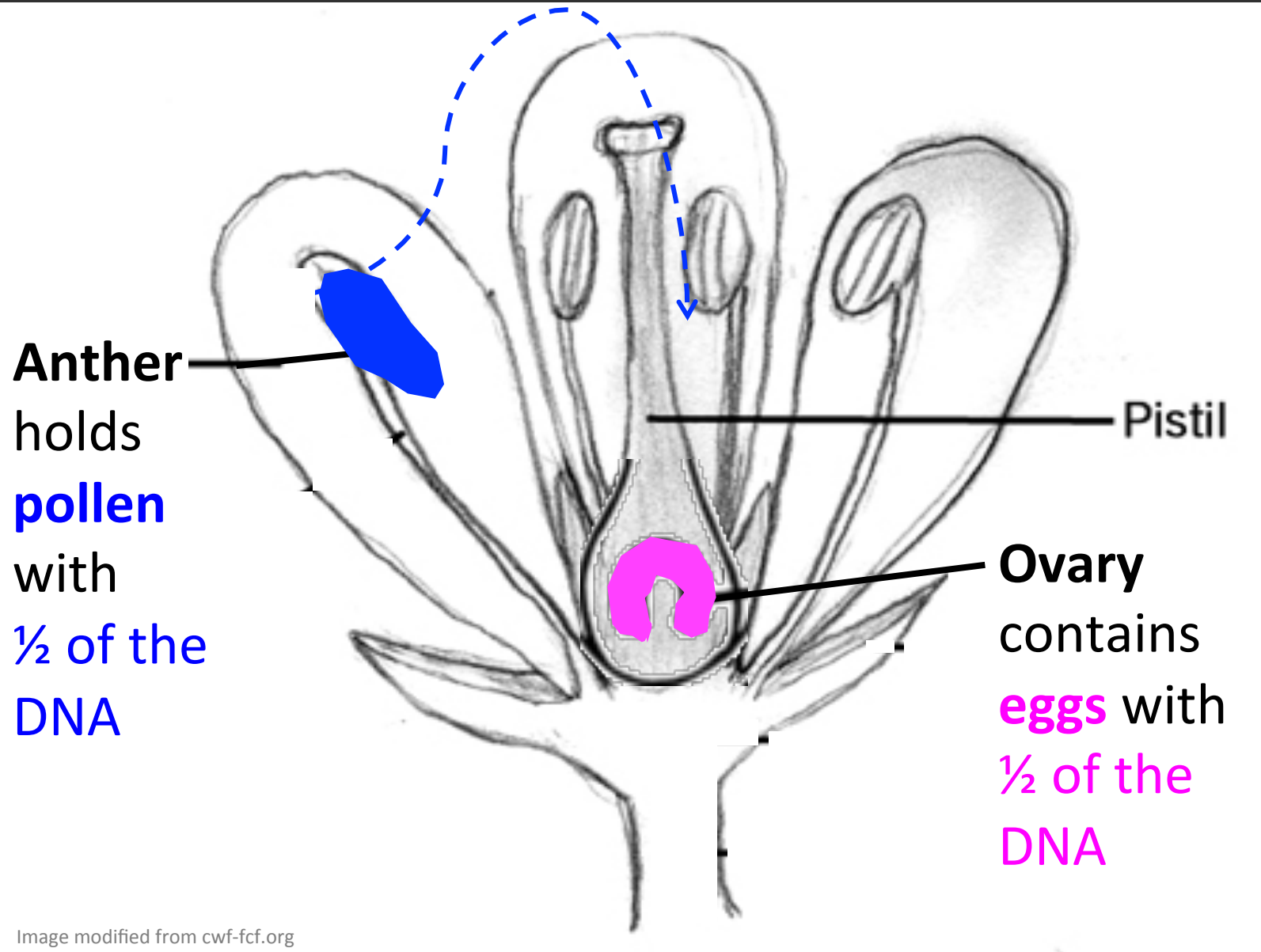
Image modified from cwf-fcf.org

Embryo with full set of DNA

Seed

=
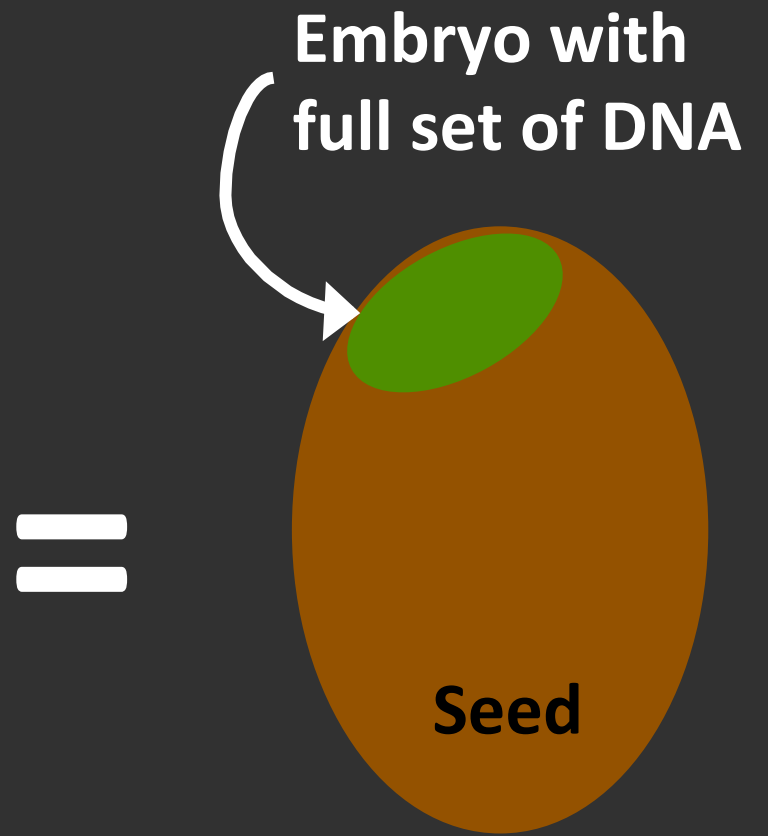
Reproduction

Human-induced cross pollination in wheat

'Red Fife' male parent with mature pollen   **'Warthog' female parent with anthers removed**
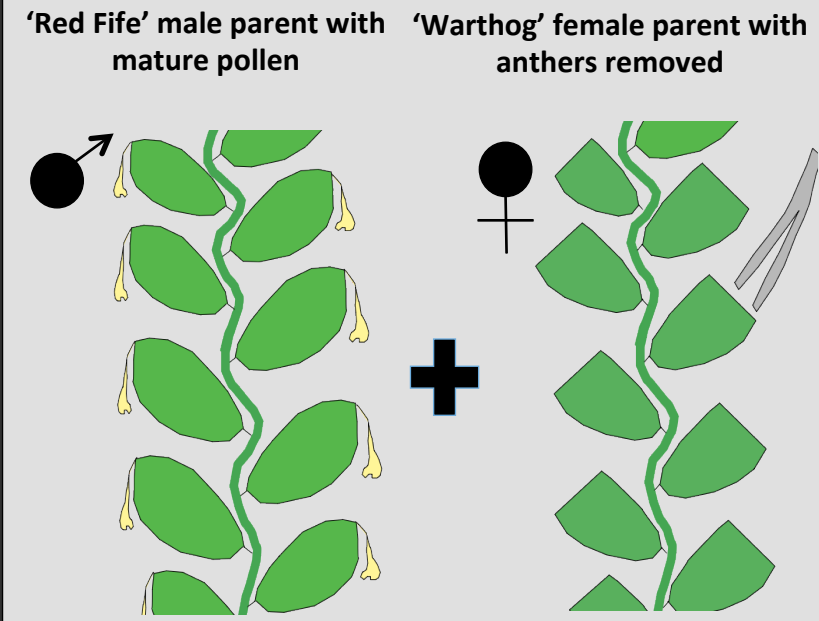
Self-pollinating	Cross-pollinating
Barley	Alfalfa
Common bean	Banana
Cotton	Carrot
Eggplant	Cassava
Lettuce	Cucumber
Oat	Maize
Pea	Onion
Peach	Potato
Peanut	Rye
Pepper	Sugar beet
Rice	Sunflower
Soybean	Sweetpotato
Tomato	Watermelon
Wheat	

Cross-pollination occurs when pollen from one plant lands on the silks of another plant.

UNIVERSITY OF Nebraska Lincoln
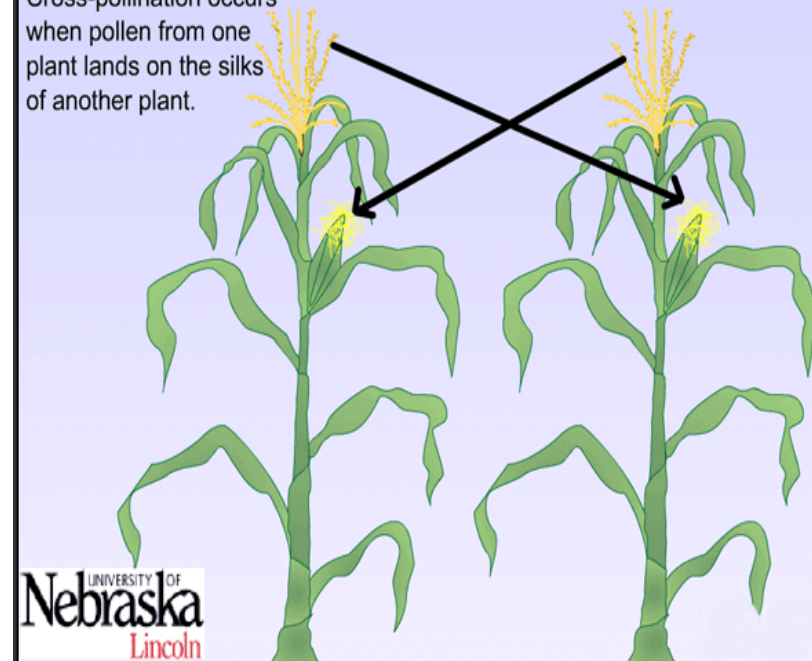
Wheat Breeding Demo

	Parent 1 HgHg	x	Parent 2 hghg

F1 hybrid   **100%** Hghg

F2   **50%** Hghg   +   25% HgHg + 25% hghg

F3   **25%** Hghg   +   75% HgHg or hghg

F4   **12.5%** Hghg   +   87.5% HgHg or hghg

F5   **6.3%** Hghg   +   94.7% HgHg or hghg

F6   **3.1%** Hghg   +   96.9% HgHg or hghg

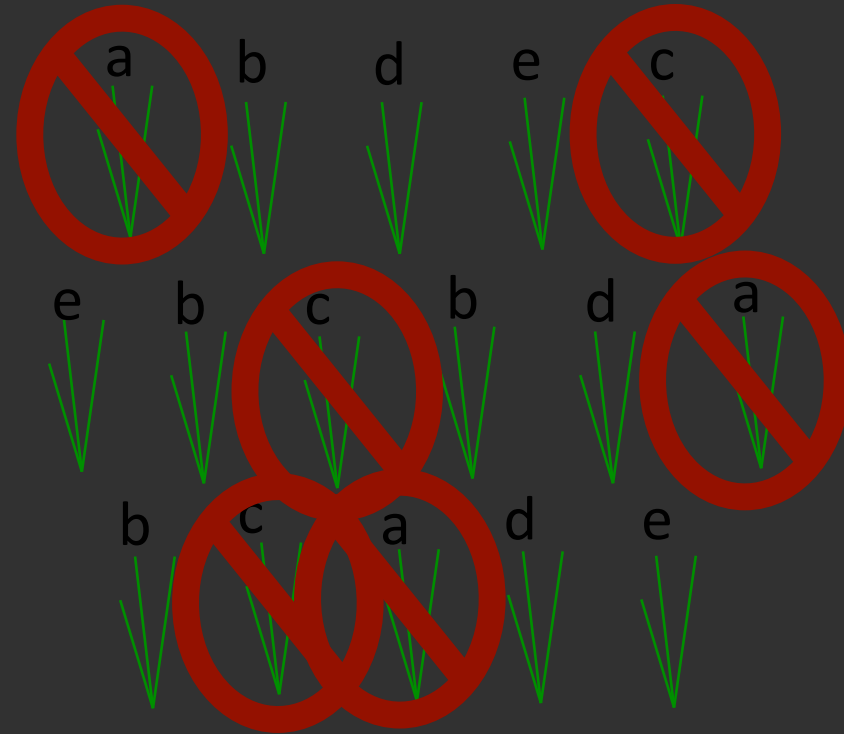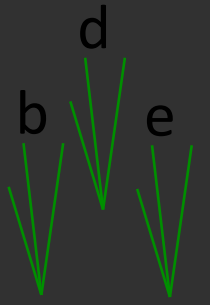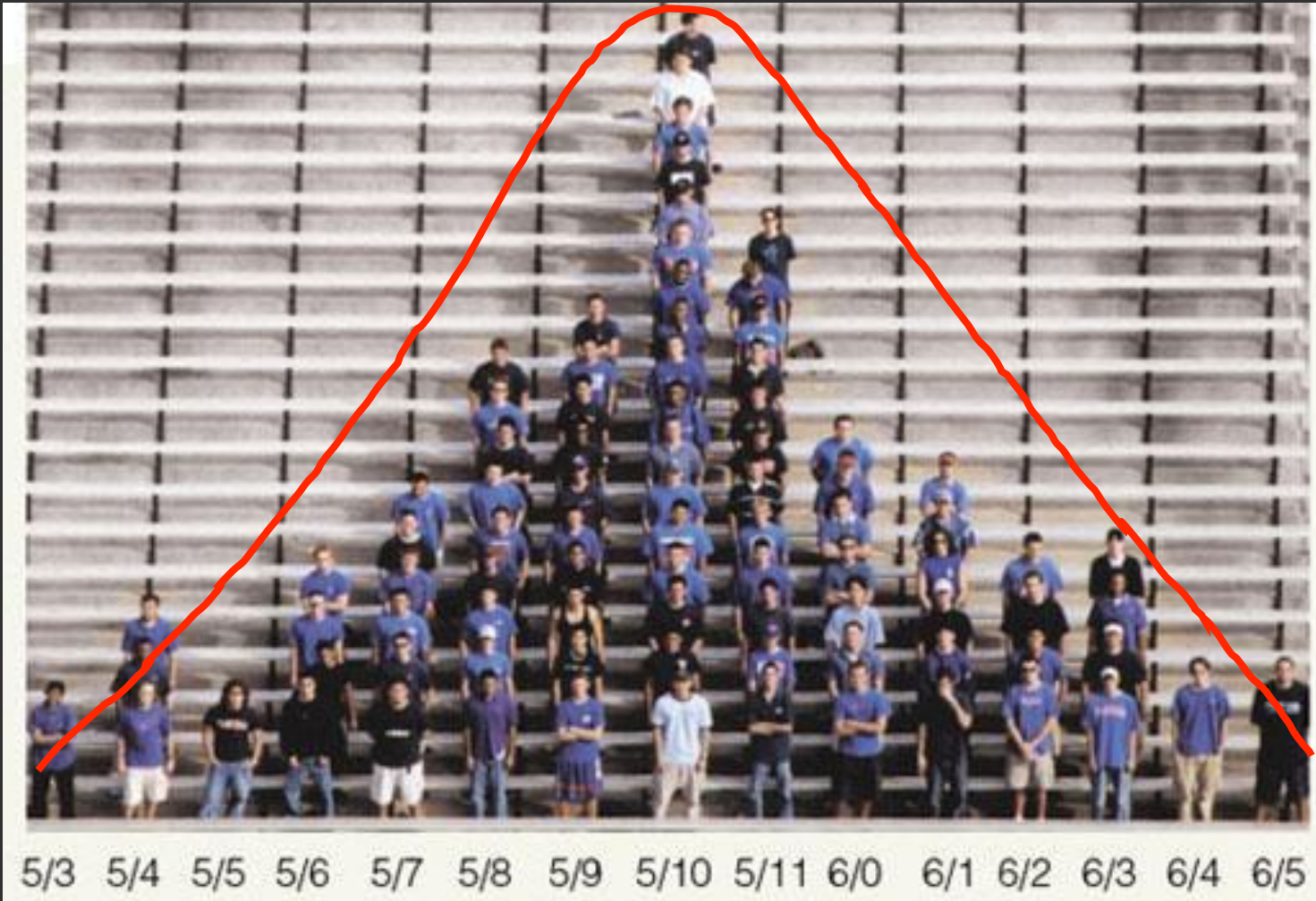# Pure Lines vs. Populations
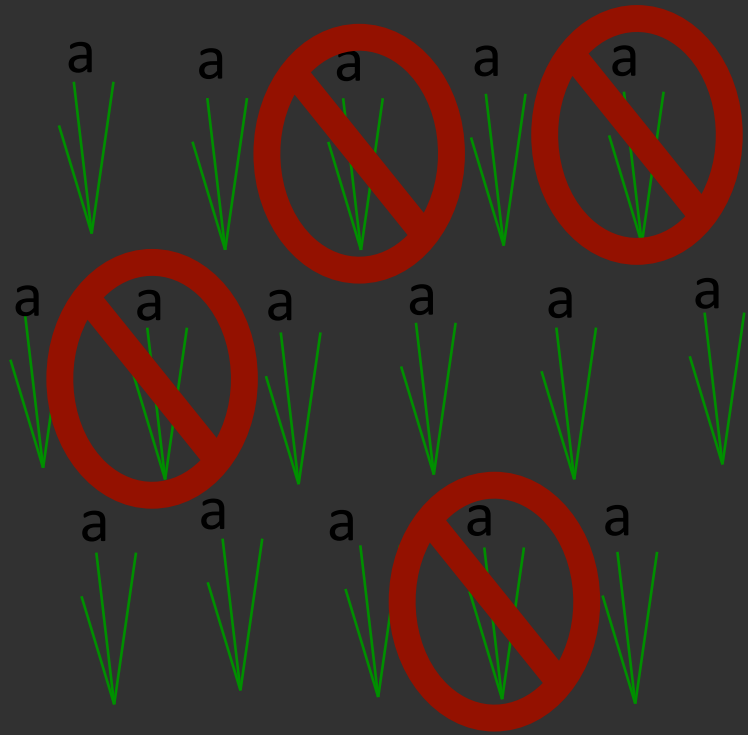
'AC Walton'

'Red Fife'

Environment

http://thomascountyag.com/2014/04/page/2/
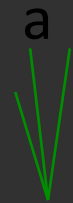
Quantitative Traits

Height

Yield =
Plants per area x
Heads per plant x
Grains per head x
Weight per grain