Class URL:

http://stan.cropsci.uiuc.edu/courses/index.php

For powerpoints and handouts. Let me know if there’s a problem.

Also, please drop me an email if you’d like to come to office hours (anytime, by appointment).
Waiter!

There’s DNA in my food!
Fun DNA fact #1

- The information in the human genome would fill two hundred 500-page telephone directories.

- The genomes of most commonly grown crops (corn, soybean) are about as large, or larger (wheat).
DNA – blueprint of life

• DNA determines the characteristics of all living organisms. Well, unless you count viruses.

• DNA is composed of a *four*-letter nucleotide/molecule alphabet referred to as A, T, C, and G.

• The combination of letters determines all the inherited characteristics of the living organism.

• Each cell in the human body contains >3 BILLION letters. A soybean cell, >1.2 billion.
(Franklin), Crick, Watson (and Wilkins) – structure of DNA
A double helix with two antiparallel strands
“It has not escaped our notice that the specific pairing we have postulated immediately suggests a copying mechanism for the genetic material.”
Base Pairing

Hydrogen bond

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The purines in DNA are adenine (A) and guanine (G), and the pyrimidines are thymine (T) and cytosine (C).
Deoxyadenosine (A nucleoside)

Deoxyadenosine 5'-triphosphate (dATP) (A nucleotide)
Figure 4-2
Structure of part of a DNA chain.
DNA extraction from plants

- Smush ("homogenize") the cells
- Dissolve membranes and solublize DNA in a detergent buffer.
- Remove solids with centrifugation
- Remove proteins with phenol extraction
- Precipitate DNA with alcohol
Fun DNA fact #2

Each cell contains 9 feet of DNA. In an average meal, you eat approximately 55,000,000 cells or about 93,205 miles of DNA.
DNA extraction issues

- Homogenization
  - has to be “just right”
- RNA
- Hydrodynamic shearing
  - treat it gently