

Integrative Biology 102: Lecture Outline

Plants Used to Feed the World

Lecture Objectives:

By the end of the lecture (and after some work with the text), you should be able to:

1. identify where energy is stored in seeds, stems and roots.
2. explain how artificial selection has changed the characteristics of domesticated plants.
3. draw and label a diagram of a monocot seed and a eudicot seed.
4. give the function of each of the parts of a seed.
5. describe the growth sequence in a germinating seed.
6. explain why seeds are good sources of nutrition.
7. list the four plants most eaten by the world population.
8. describe the types of environment where wheat, maize, rice, cassava, and millet are grown.
9. explain "center of origin" and list the centers of origin for each of the plants covered in the lecture.
10. explain what the "doomsday vault" is and why it is important for future food security.
11. identify which part of each plant is eaten.

Readings: Ch. 9.2, page 184 and in *Plants & Society*, pages 91, 188-189, 193, 198-203, and 221-231.

Terms:

- | | | |
|----------------|----------------|-----------------|
| * tuber | * pulses | * "eye" |
| * green manure | * groundnut | * farinha |
| * genome | * stem cutting | * tuberous root |
| * endosperm | * cotyledon | * domestication |
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1. Plants that power the world

Plant	Reason for ranking

2. Where energy is stored

* Seeds

o Parts and their functions



o Germination sequence

o Food security

* Roots

* Stems

3. Artificial selection and plant domestication

4. Grains

* Wheat

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

* Corn/Maize

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

* Rice

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

- * Sorghum

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

- * Millet

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

5. Pulses

- * Top 5 countries

- * Chickpeas

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

- * Peanut

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

- * Soybean

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

6. Tubers and Roots

- * Top 5 countries

- * White Potato

- o Form of food and nutritional value

- o Center of origin and type of environment

- o Top five producing countries

- * Sweet Potato

- o Form of food and nutritional value

- o Center of origin and type of environment

- * Cassava/Yuca/Manioc

- o Form of food and nutritional value

- o Center of origin and type of environment

* Yam

o Form of food and nutritional value

o Center of origin and type of environment

For the next lecture on Flowering Plant Reproduction, read Ch. 5 in Plant & Society by Levetin & McMahon online in Moodle and be ready to answer these questions in lecture:

- * What is unique about meiosis?
- * What is the significance of meiosis in the plant life cycle?
- * What are the products of meiosis, and where do they occur in flowering plants?