

World Food Crops

Required readings:
Balick & Cox: p. 89-91

The diversity of food crops is very low compared to the diversity of world food plants

- 50 000 edible plant species
- 250-300 food crops
- 15 crops provide 90% of world's food energy intake
- 3 crops provide 60% of world's food energy intake diet

Most of the world's cultures depend on cultivated grass grains (cereals)

- 70% of the earth's farmlands are dedicated to grain production

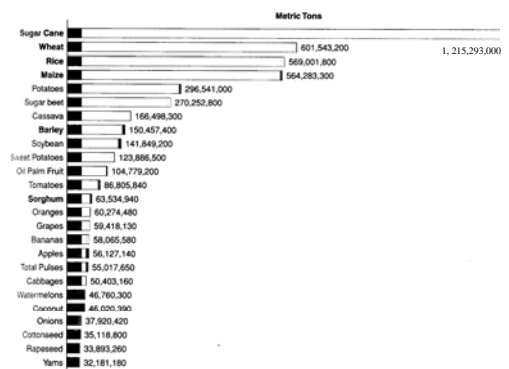
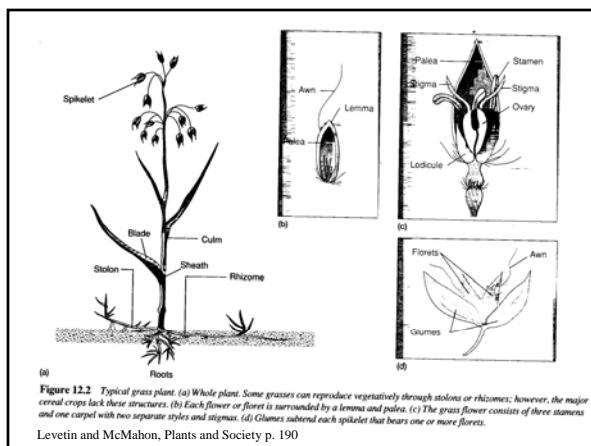


Figure 12.1 Annual world crop production figures reveal that many of the top 25 crops are grasses. Source: FAO Production Yearbook, 1997.

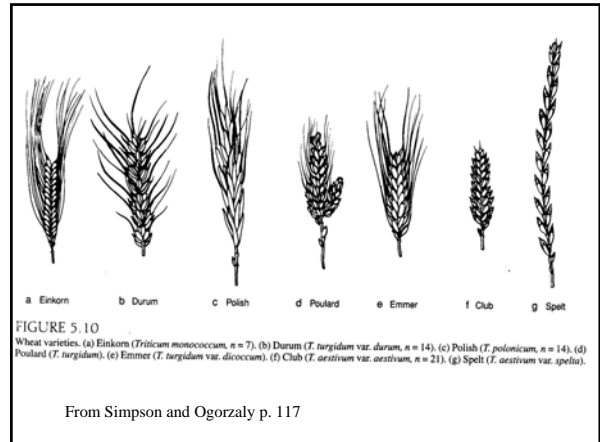


Rice (*Oryza sativa*)

- Feeds more people worldwide than any other crop.
- Cultivated ~10 000 years ago in the Yangtze river region, in China
- Grown in flooded fields (paddies) and in upland areas (dry)
- Three major kinds of rice (indica, japonica or sativa, javanica); thousands of varieties
- Integral part of Asian cultures for thousands of years

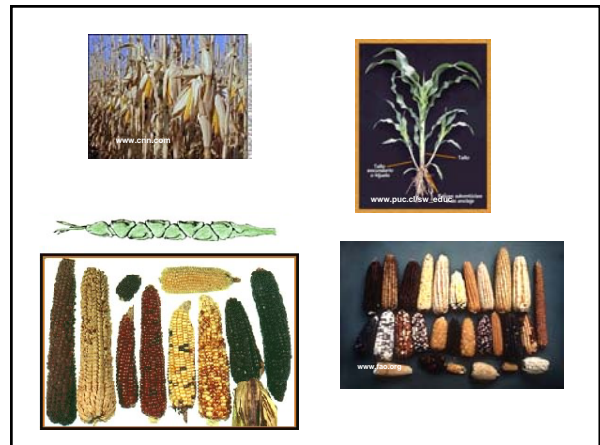
Wheat (*Triticum* spp.)

- Most widely cultivated cereal in the world, the 'staff of life'
- Domesticated ~ 9000 years ago in Near East
- Thousands of varieties
- Duram wheat (*T. turgidum*) – pastas
- Bread wheat (*T. aestivum*) – breads
- Important part of many cultures across globe



Corn (*Zea mays*)

- Formed basis of New World civilizations (Maya, Aztec, Inca)
- Domesticated in Mexico from teosinte ~ 7700 years ago.
- Major commercial corn types: popcorn, flint, flour, dent, sweet, waxy. Hundreds of varieties



Human selection has had large effects on the morphology and ecology of grain plants

- Selection for erect form, less branching
- Selection for short plant stature
- Selection against shattering of seeds
- Selection for 'free threshing'

Legumes

- Almost every major civilization since the development of agriculture has had a legume as well as grain as part of its support system
- Examples:
- Most species form root associations with nitrogen-fixing bacteria. This makes them rich in protein and allows them to enrich soil with usable Nitrogen

Soybeans (*Glycine max*)



- Most important legume crop in the world
- Domesticated in northeastern China ~ 3000 years ago.
- One of the sacred crops of the ancient Chinese.
- Forms of preparation



Legumes: changes due to human selection pressures

- Reduction of seed scattering
- Increase in seed size
- Synchronous flowering
- Lack of dormancy

Polynesian societies did not depend on cereals but on storage crops from modified stems and roots

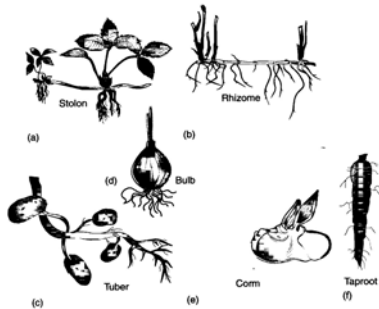


Figure 14.1 Modified stems and roots: (a) stolon; (b) rhizome; (c) tuber; (d) bulb; (e) corm; (f) taproot.

Levetin & McMahon, Plants and Society p. 223

Cultures adopt and adapt major world crops

- Historical and contemporary movements of crops
- The same plants are grown and used differently by different cultures

Mango (*Mangifera indica*)



- Most popular fruit on a worldwide basis
- Native to Southeast Asia



Shredded mango "local style"



Li hing mango



Green honey mango



Mango, shredded white



Mango seed

www.crackseeds.com

Chili (*Capsicum spp.*)



- Domesticated in Mexico ~ 9000 years ago?
- Indispensable part of Native Mexican diet when Cortez arrived
- Many varieties today
- Part of the cuisine of many cultures

Tomatoes (*Solanum esculentum*)



- First domesticated in Mexico sometime before 500 AD
- Introduced to Europe in early 1500s, first rejected, and then adopted only in the 1800s
- Today grown around the world and associated with US, Italian and other cultures

'Philipino' vegetables in Hawaii

Name	Origin
Okra	East Africa
Bitter melon leaves	Asia
Marangay	Middle East/India
Chop suey yams and leaves	Mexico
Tamarinds	Tropical Africa

Changes of a Portuguese soup

- Portugal: kale soup
- India: kale and spices
- Caribbean: taro leaves
- Hawaii: kale and sausage

Cultures adopt and adapt major world crops

- Historical and contemporary movements of crops: culture adopt and adapt food plants
- **The same plants are grown and used differently by different cultures**

The diversity of food crops is very low compared to the diversity of world food plants

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Eat these flowers: Day lily blossoms are healthful

By Heidi Bornhorst
Advertiser Garden Columnist

Did you know that you can eat day lily flowers? And that they are very good for you and 'tino uzo'?

Day lilies are full of beta-carotene. They are quite yummy, right out of the garden. You can also use them in salads, soups, tempura, or other tasty treats. People in China have been eating day lily blossoms as a culinary delight for centuries.

My neighbor Aiko is a recent convert to eating day lilies in her salads. She really likes how they taste and says they give her health benefits, especially when combined with other healthy diet changes (less salt, sugar, fat and processed foods, and more natural, fresh-from-the-garden favorites).

A large, golden orange variety of the flower has graced Hawai'i gardens for years. This is a tough, less-thirsty, pest-resistant perennial. It is great at choking out weeds! A lovely planting of this old-time favorite lines the road to Lyon Arboretum, way in the back of Manoa Valley.

There is also a variety with smaller, translucent, yellow flowers that's been around awhile. Never varieties are being bred right here in Hawai'i. Some are mini and dwarfs and many have unusual flower colors and combinations. There are also double-flowered forms. One of the top growers is Mauna Kea Daylilies on the Big Island. Mauna Kea Daylilies' concert comes to many benefit plant sales here on O'ahu.

Day lilies are fun to breed. It is easy to cross-pollinate the flowers. The seed pods follow the flowers and split open to reveal many flat, black seeds inside. Plant these and see what comes up. It requires patience, though. It takes about three years from seed to blooming. But you might come up with an epic new variety!



Production of major world crops can affect local patterns of food consumption, local foods and local cultural traditions

Examples:



www.photolib.noaa.gov



<http://www.sammio.com>

Production of major world crops can affect local patterns of food consumption and local cultural traditions

- 'Improved' varieties take place of local varieties (Green Revolution; GMOs)
- Imports of artificially low priced produce inhibit local production

Adoption of major world crops can affect the health and nutrition of many cultures through displacement of traditional foods.



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Major world crops as agents of cultural and social changes

Examples

Historical:

Current:

The relationships between culture and crops are dynamic

As agricultural practices change so do cultural practices

Ex. Subsistence versus cash crops

As cultural practices change so do agricultural practices

Ex. Amaranth in Mexico

Key Concepts

- Worldwide agriculture and human diet are dominated by a very small number of plant crops.
- These crops play an important role in the cultures where they are consumed. Similarly, human cultures have played an important role in shaping the diversity and varieties of these food crops
- Production of major world crops can also affect local cultural traditions where they are grown.
- The relationship between crops and cultures is dynamic as both move through space and time.

STUDY GUIDE QUESTIONS

- What two kinds of food crops do most of the world depend on? Provide examples and name their place of origin
- What kinds of food crops did Polynesian societies depend on?
- Name three major grain crops and discuss one occasion/ritual/ceremony associated with one
- Discuss 2 ways in which production of major world crops can affect local cultural traditions
- Give an example of how the adoption of some major world crops can affect the health and nutrition of certain cultures

STUDY GUIDE QUESTIONS

- Name one way in which human cultures influenced the biology of agricultural crops
- Give an example of how a crop domesticated in one part of the world has been adopted into a culture in another part of the world.
- In what ways is the relationships between culture and crops dynamic?