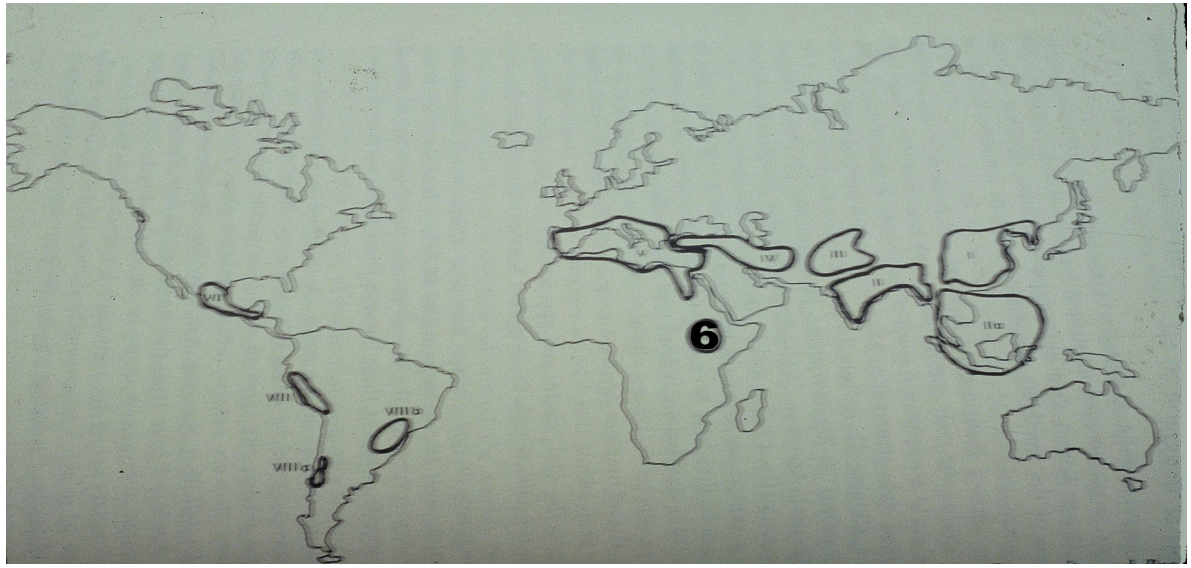
6. The Abyssinian Center



-Sesame (Gergilim)
Sesamum indicum

-Castor bean (Mamona)
Ricinus communis

-Coffe (Café)
Coffea Arabica

-Durum wheat
Triticum durum

-Teff
Eragrostis abyssinica

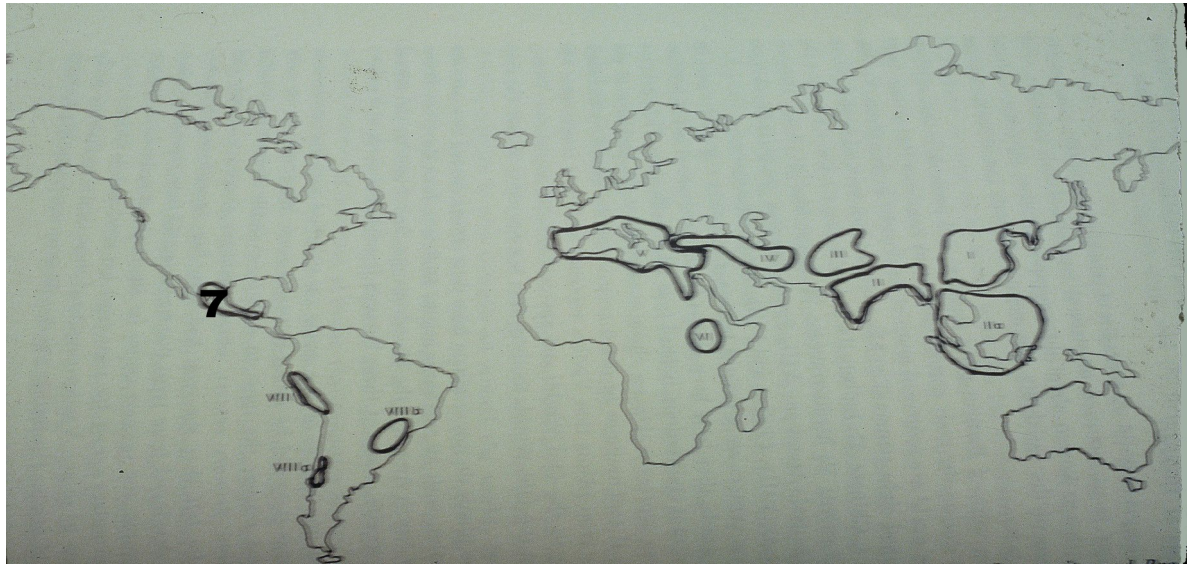
-Barley (Cevada)
Hordeum vulgare

-Pea (Ervilha)
Pisum sativum

-Chick pea (Grão-de-Bico)
Cicer arietinum

-Poulard wheat
Triticum turgidum

7. The South Mexican and Central American Center



-Corn (Milho)
Zea mays

-Upland cotton (Algodão)
Gossypium hirsutum

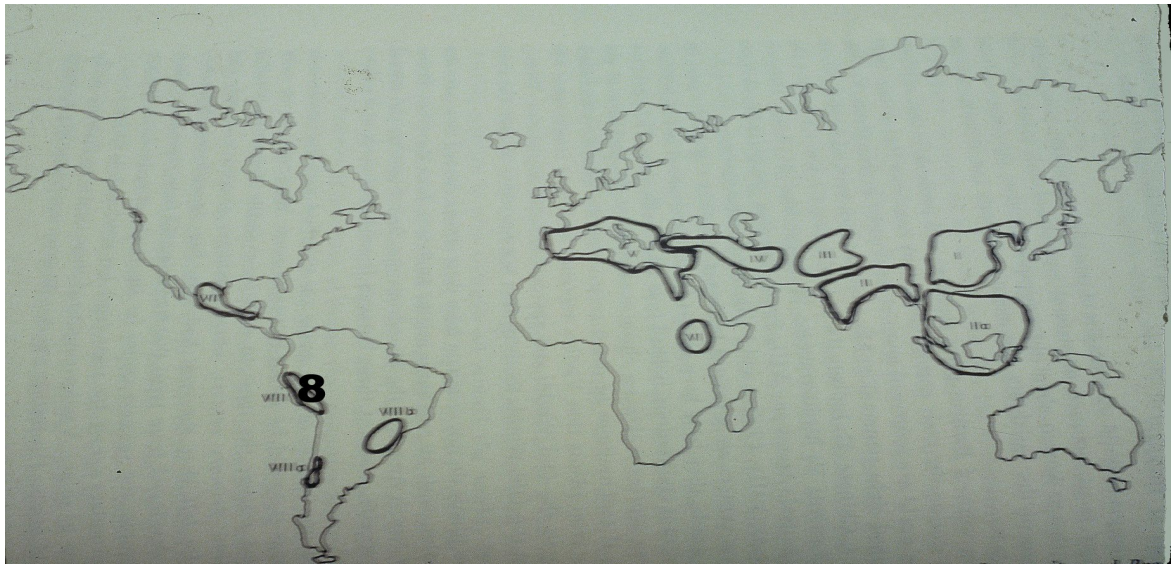
-Common beans (Vagem)
Phaseolus vulgaris

-Sisal hemp
Agave sisalana

-Pepper (Pimenta)
Capsicum annum

-Squash (Abóbora)
Cucurbita spp.

8. South American (Peruvian-Ecuadorean-Bolivian) Center



-Tobacco (Fumo)
Nicotiana tabacum

-Sweet Potato (Batata Doce)
Ipomoea batatas

-Tomato (Tomate)
Lycopersicum esculentum

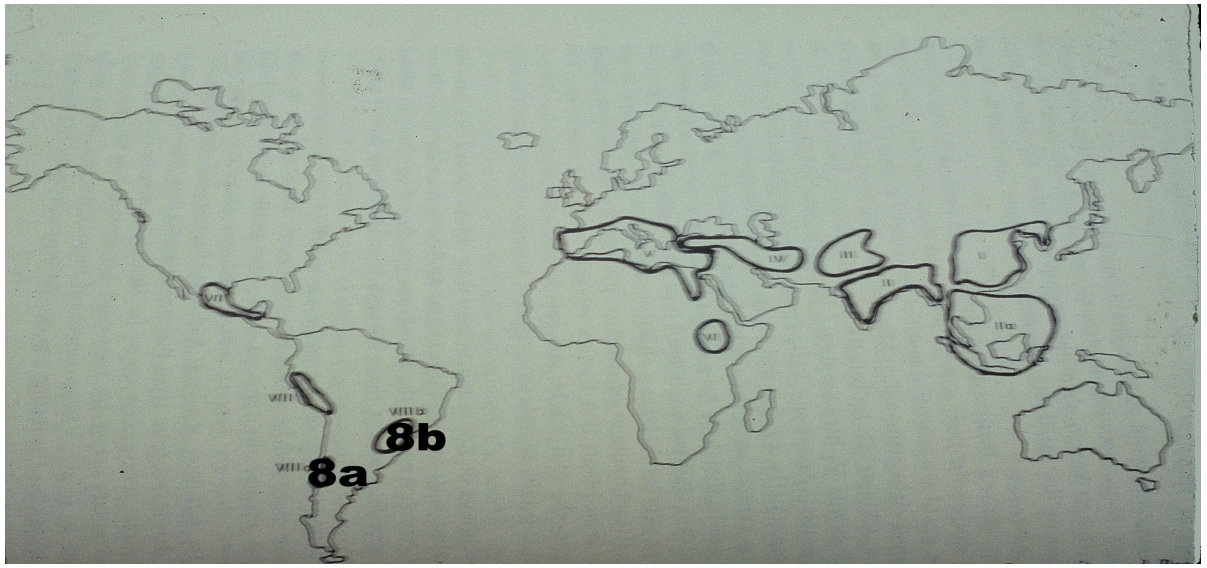
-Potato (Batata)
Solanum tuberosum

-Sea Island Cotton (Algodão)
Gossypium barbadense

-Lima bean (Feijão Fava)
Phaseolus lunatus

-Papaya (Mamão)
Carica papaya

8a, 8b The Chiloe and the Brazilian-Paraguayan Center



-Peannut (Amendoim)
Arachis hypogaea

-Potato (Batata)
Solanum tubersum
(The Chiloe Center)

-Rubber tree (Seringueira)
Hevea brasiliensis

-Manioc (Mandioca)
Manihot esculenta

-Pineapple (Abacaxi)
Ananas comosa

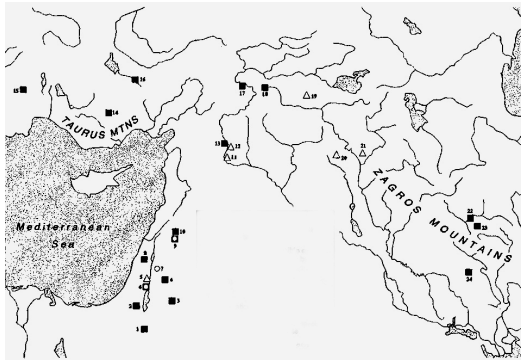
-Cacao (Cacau)
Theobroma cacao

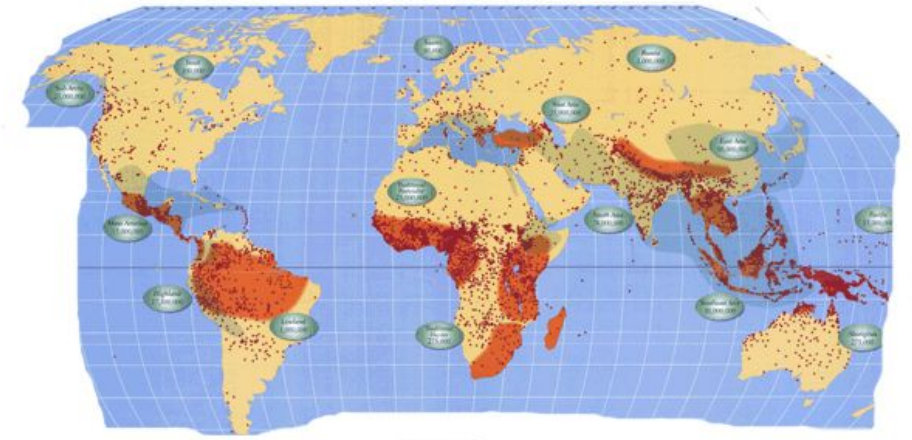
-Purple granadilla (Maracujá)
Passiflora edulis

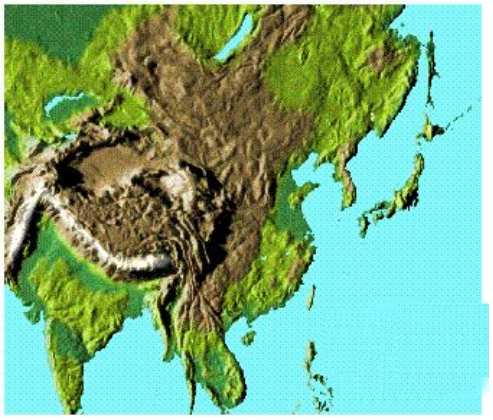
Course by Nagib Nassar

3.2 Vavilov Revised

Noncenters Concept (Harlan, 1971)







3.3 Dynamic of diversity

3.3.1 Hybridazation

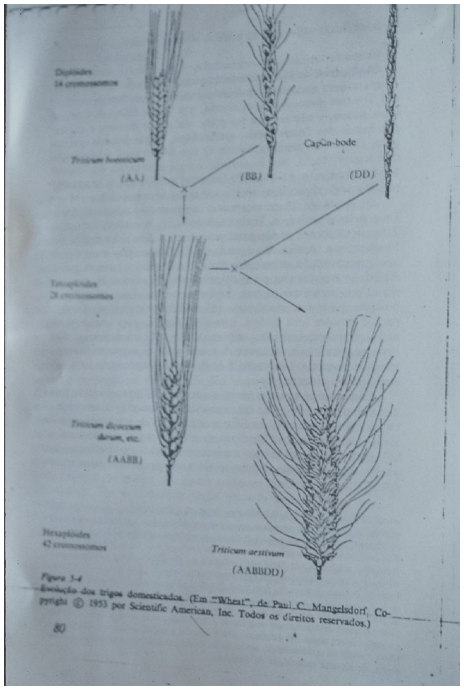
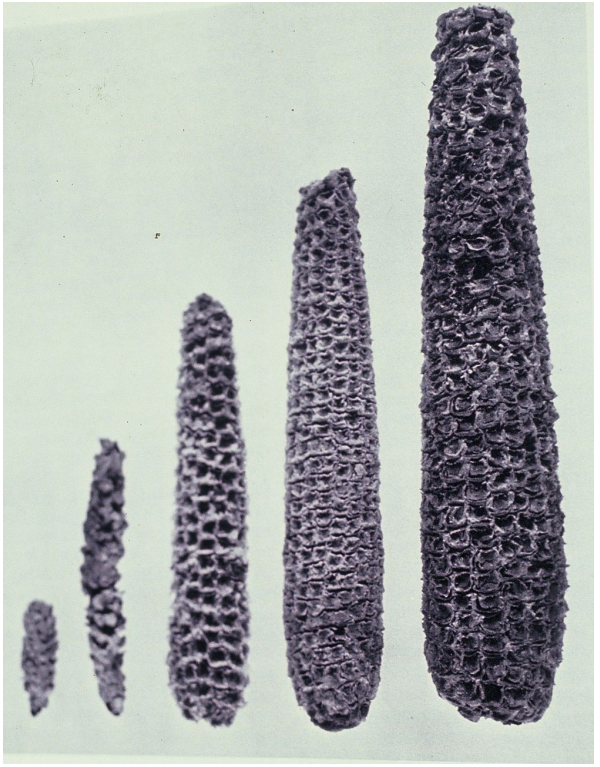


Figura 3.4
Evolução dos trigos domesticados. (Em "Wheat", de Paul C. Mangelsdorf. Copyright © 1953 por Scientific American, Inc. Todos os direitos reservados.)

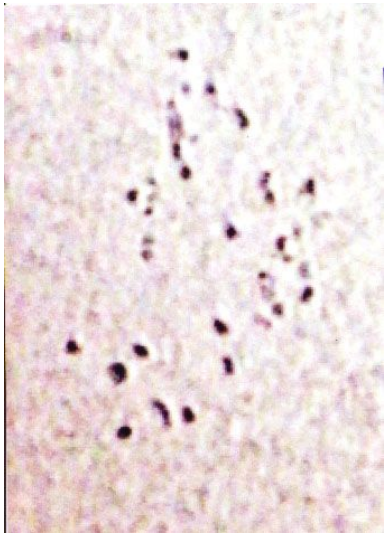
80

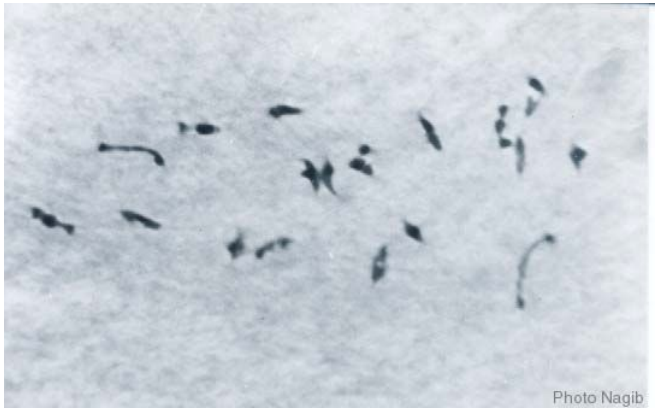
3.3.2 Topography and Population Fragmentation

3.3.3 Introgression



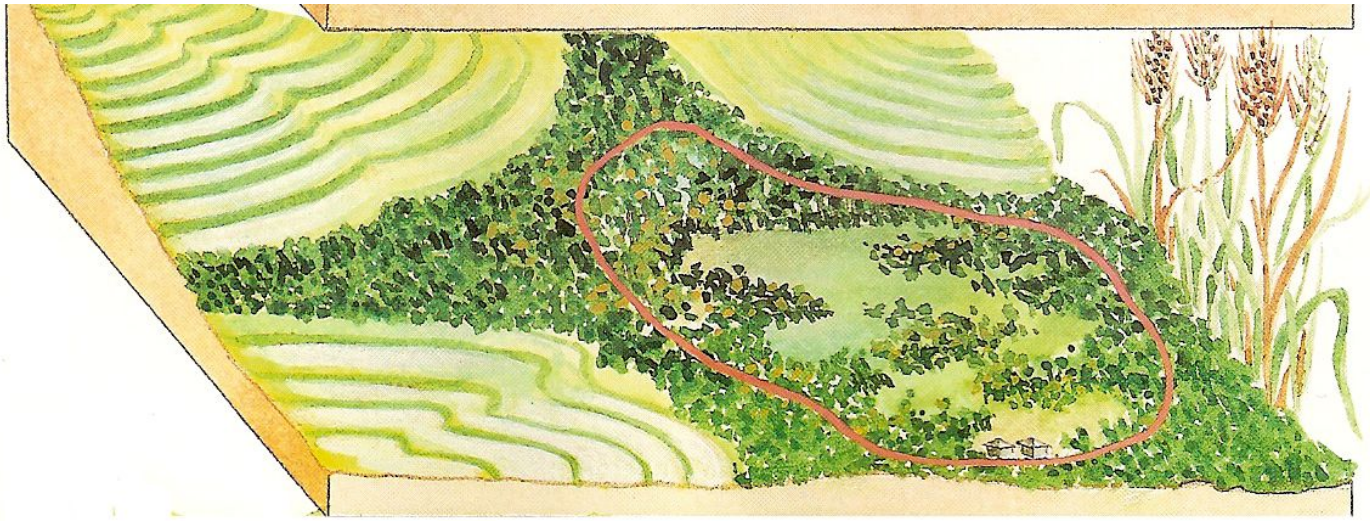
3.3.4 Polyploidy





Genetic Resources Conservation

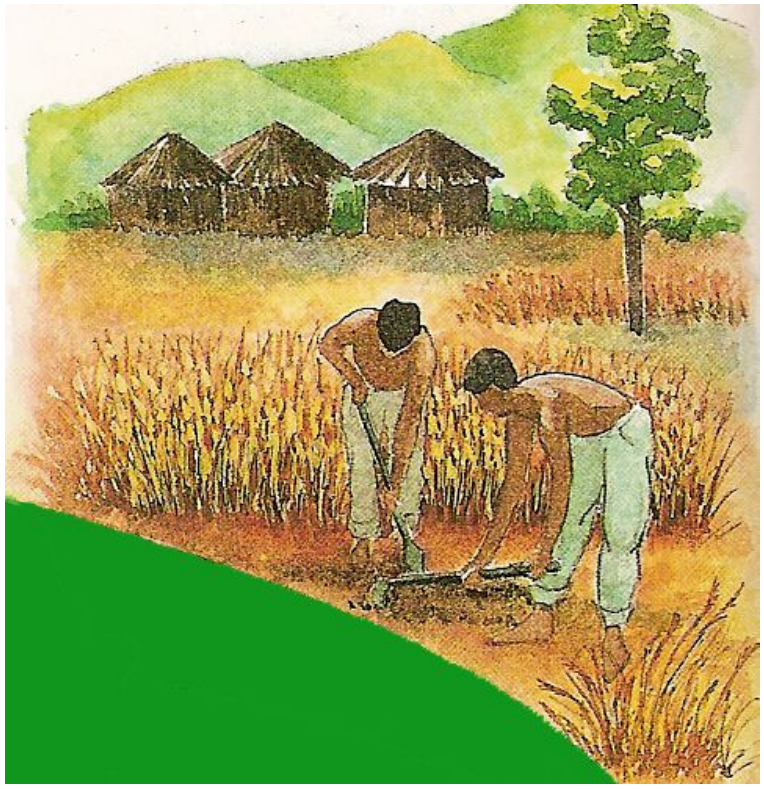
1. Conservation *in situ*



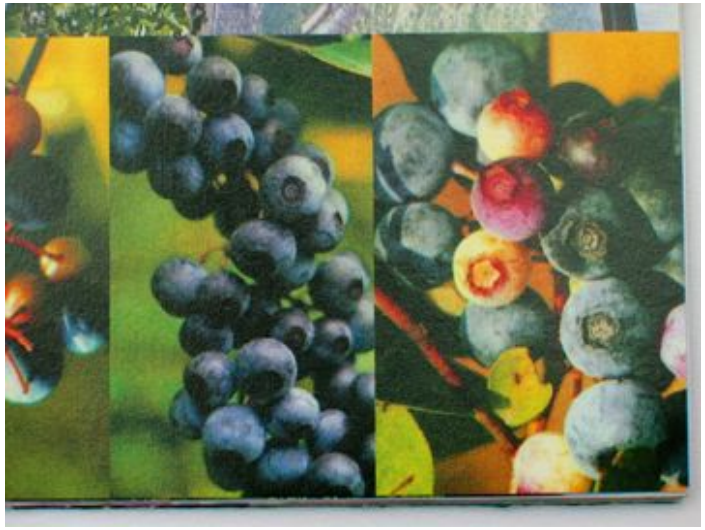
2. Conservation *ex situ*

2.1 Living Collection

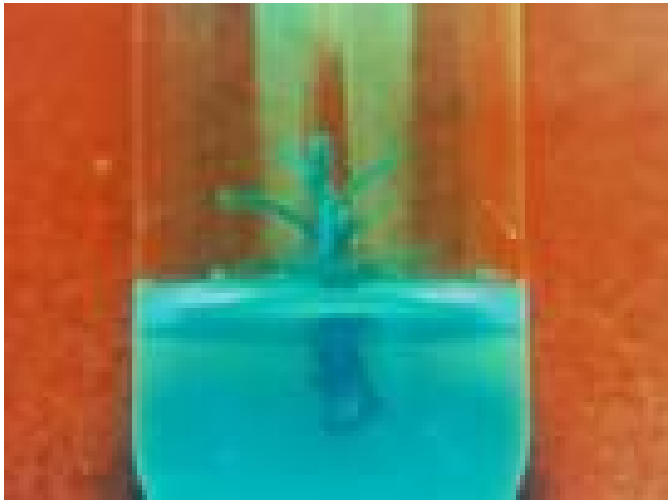
2.2 On-farm conservation



2.3 Seed Bank



2.4 Tissue culture



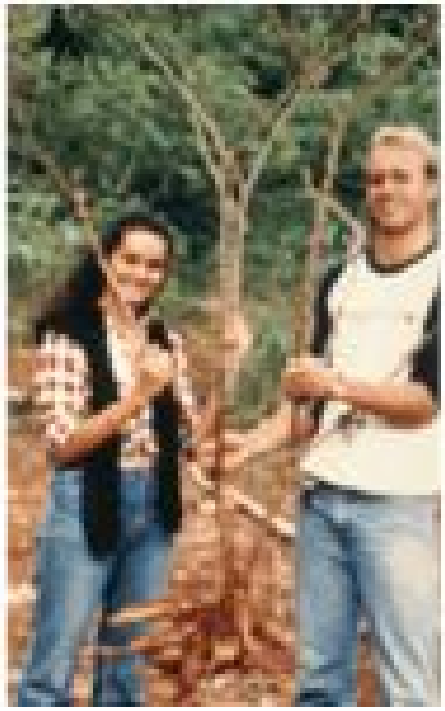
Genetic Resources Manipulation

1. Gene Transference by Interspecific Hybridization

1.1 Breaking interspecific barriers

A- Reciprocal crosses *Malus pumila* and *M. baccata*

Or ***Manihot esculenta x M. glaziovii***



x

B- Environmental conditions

Prunus dulcis

x

Prumus persica

B- Environmental conditions

In cassava

x

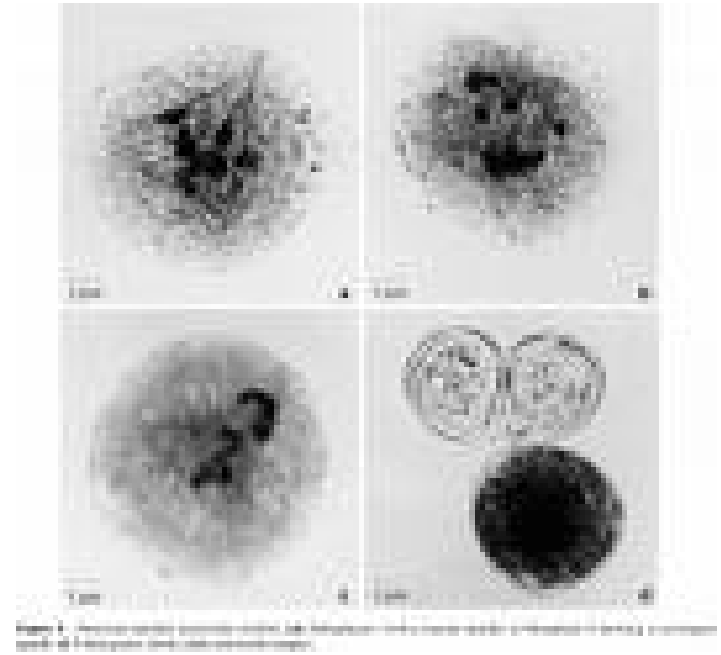
In cassava

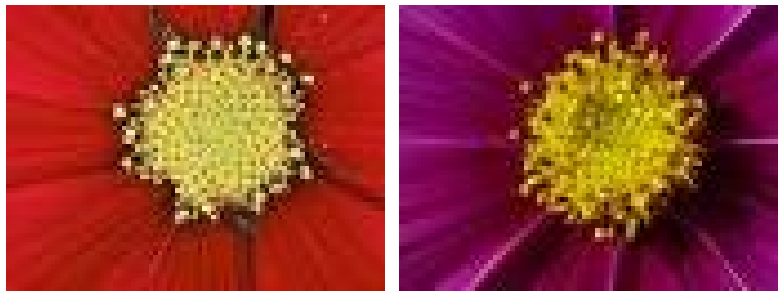
x

C- Mentor Effect

The case of manihot pohlii x cassava

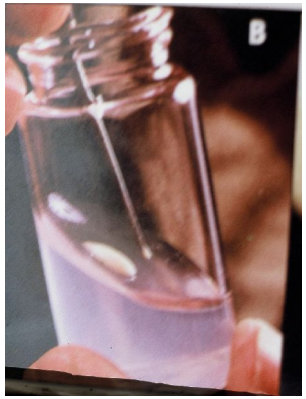
D- The use of male steril cultivars as maternal





E- Gametic diversity

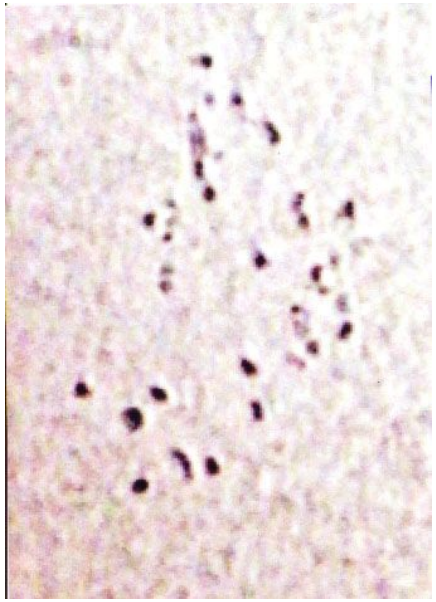
F- Embryo Culture



G- Bridge hybrid

Fig. 18
M. neusana
Photo by Nagib

H- Chromosome Duplication

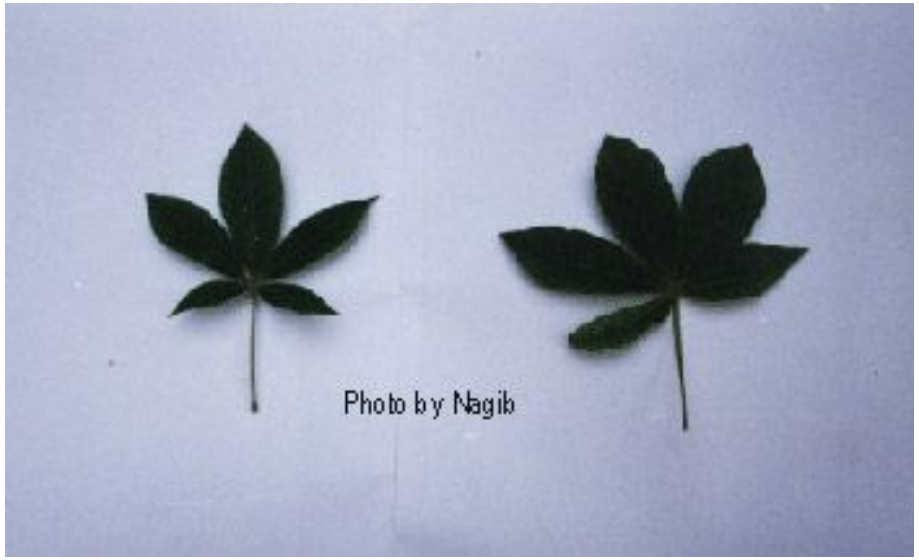


Contin... Genetic Resources Manipulation

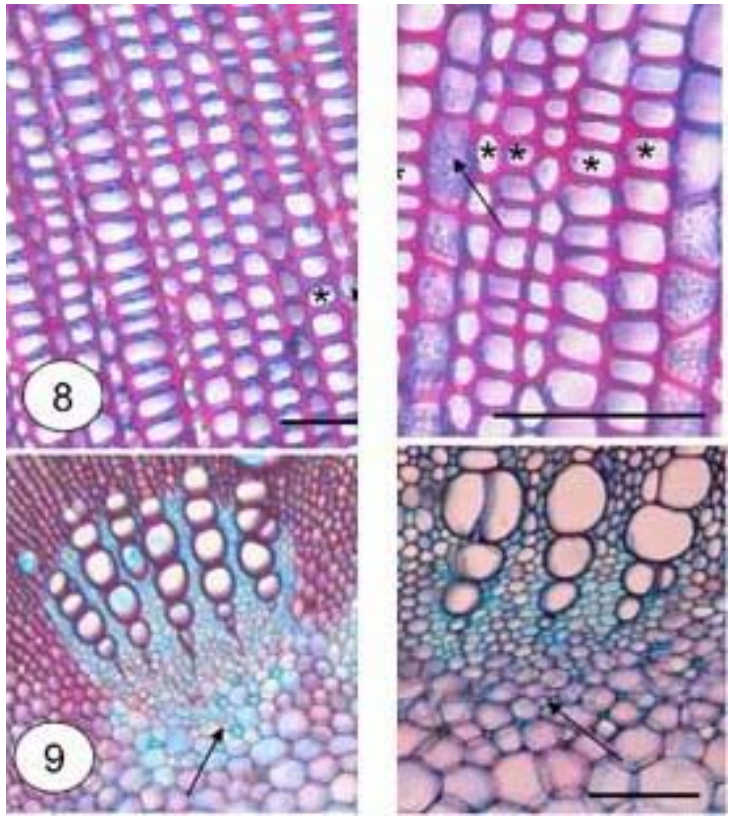
2. Interespecific Hybrids Polyploidization

a. Method

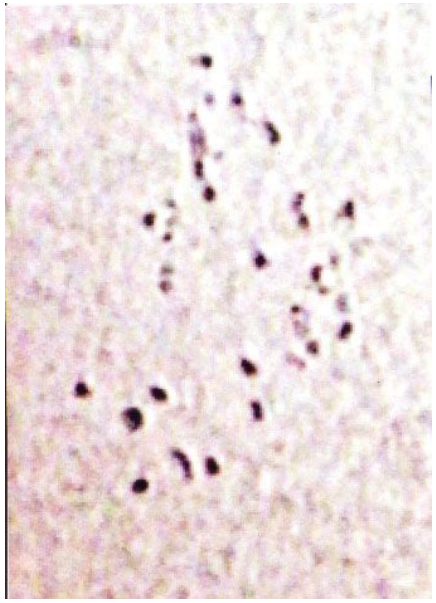
b. polyploid production

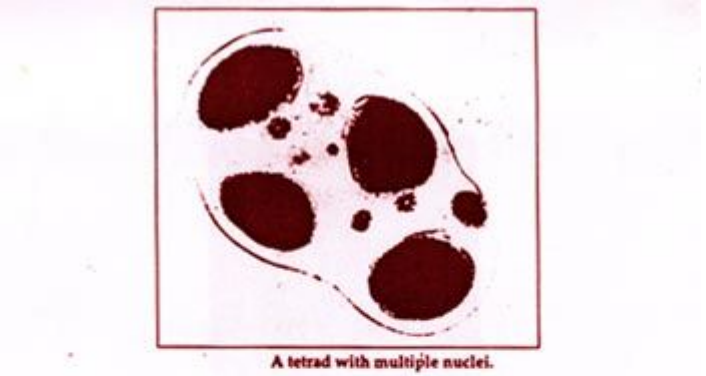


c. Chimera types

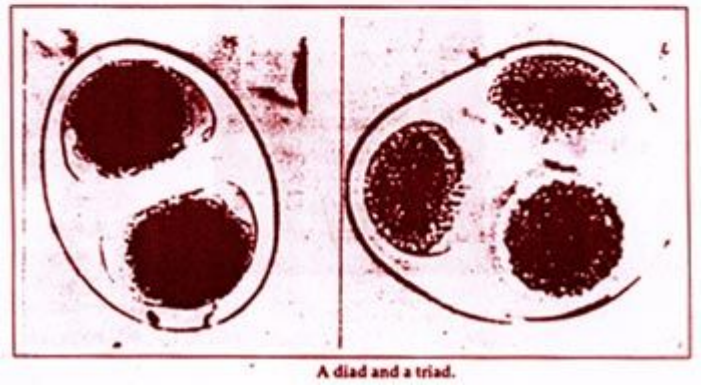


d. Detection of polyploidy





A tetrad with multiple nuclei.



A diad and a triad.

Origen of Agriculture

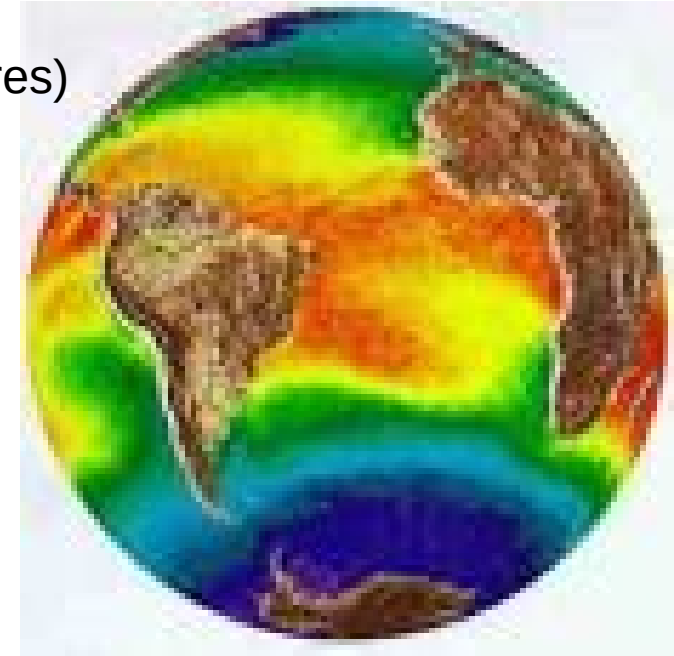
1. Domestication for religious reasons

2. Domestication due to change of climate (Childe)

-Crowded (Multidão)

- Distúrbio de Solo

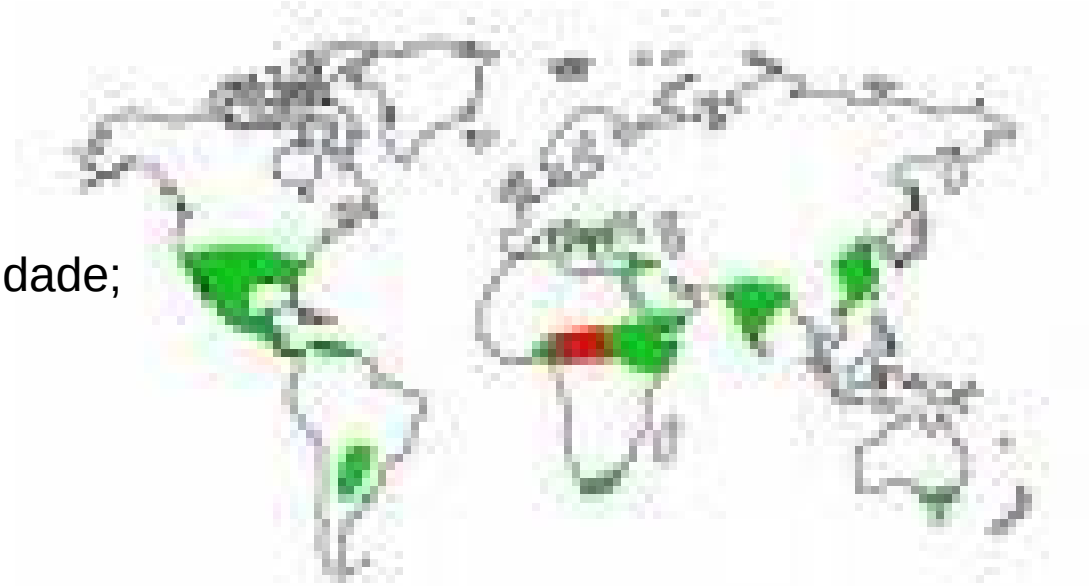
- Revolução Neolítica
(Caçadores → plantadores)



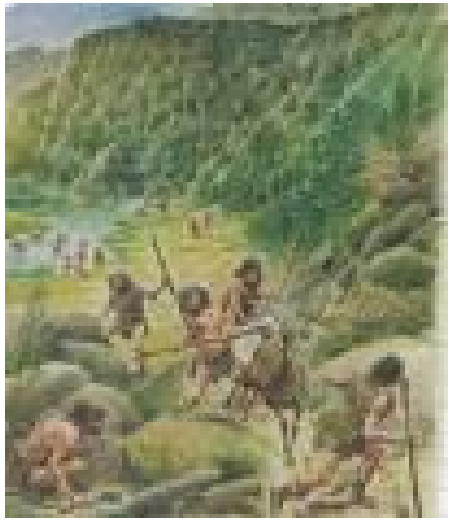
3. Agriculture as a discovery (Sauer theory)

(Teoria difusionista)

- falta de alimentos;
- diversificação;
- inundação;
- stoloniferos;
- sedentária;
- difusão e superioridade;



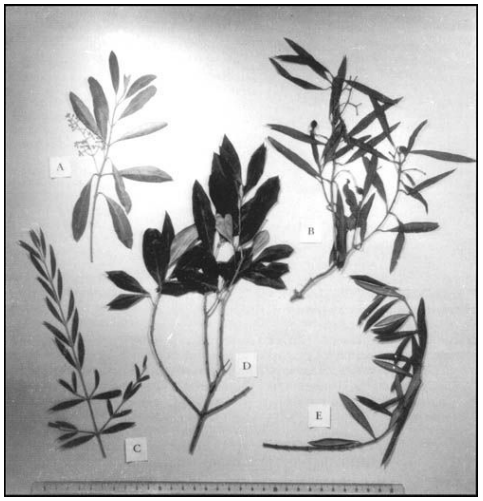
4. Agriculture as an extension of gathering (Binford theory)



VI Classification of cultivated plants

a. Objectives and utilization of this type classification

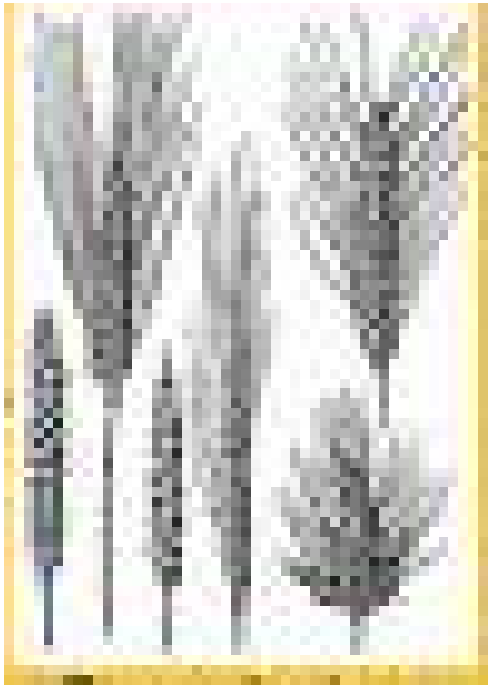
b. Pattern of variation in cultivated plants



c.The Gene Pool system

VII The Dynamic of Domestication

a. What means domesticate

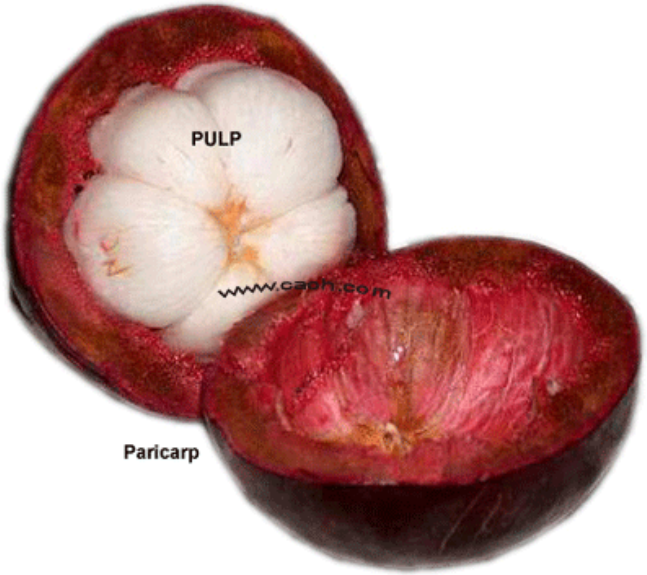


b. Intermediate forms of domestication

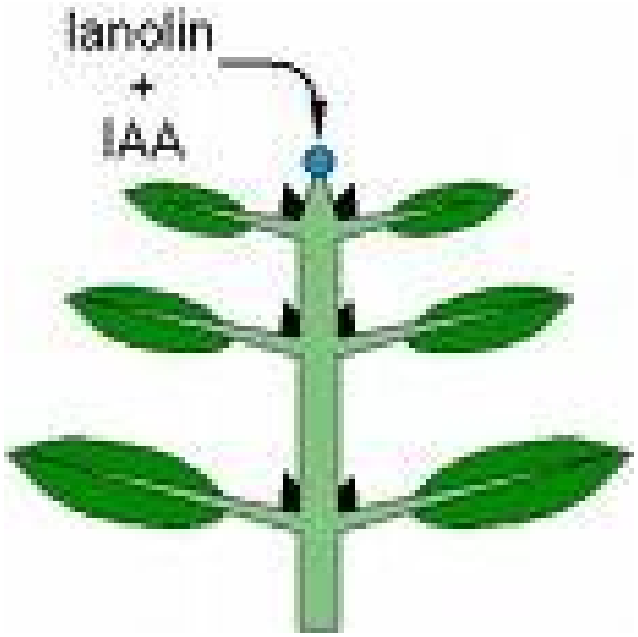
- example of boabab, ***Adansonia spp.***

- ***Acacia albida***

c. Modified characters by domestication
c.1. Dispersion



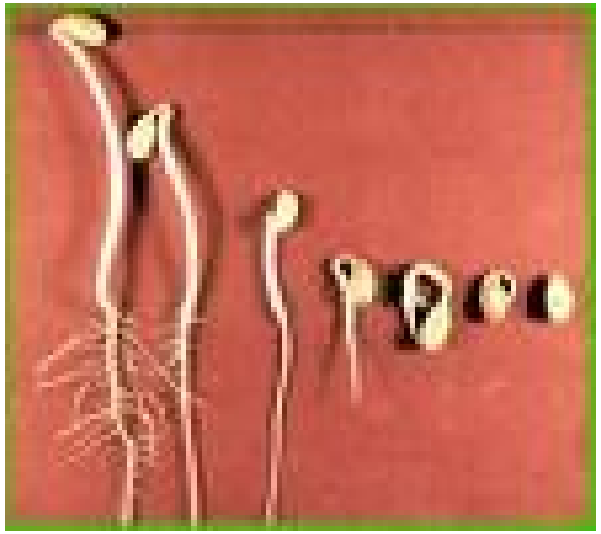
c. 2. Apical Dormency

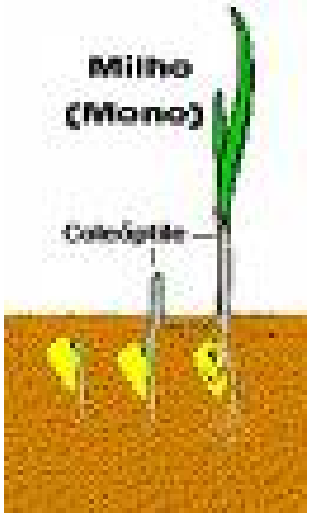


c. 3. Sensibility to Fotoperiodism and Maturation Uniformity

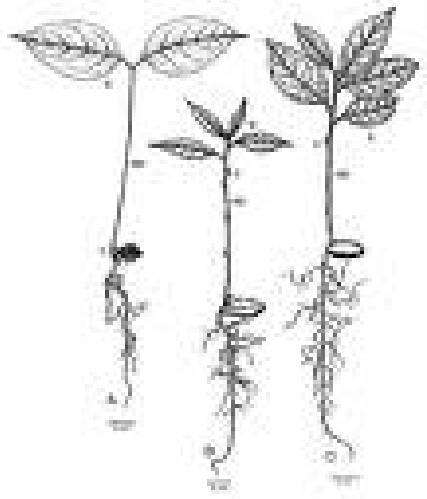
c. 4. Increase of seed size

c. 5. Reduction of germination inhibitors





c. 6. Protein and Carbohidrate Content



d. Mechanisms of selection for domestication

d.1. Competition of seedlings

d.2. Interaction crop - weed

- **Patterns of variation in cultivated plants**

1. Causes of variation

a. **Time**

b. **Topography**

c. **Tribes**

d. **Introgression**

a. Time and mutations

b. Topographical Heterogenity

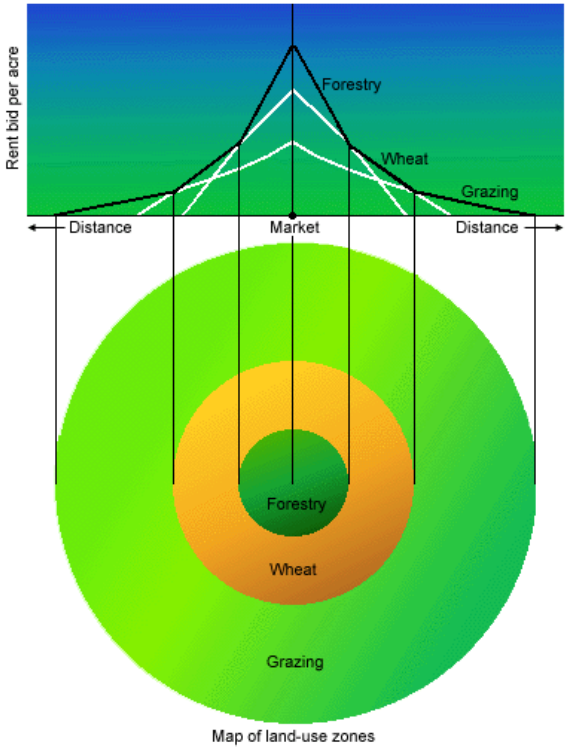
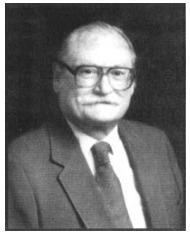
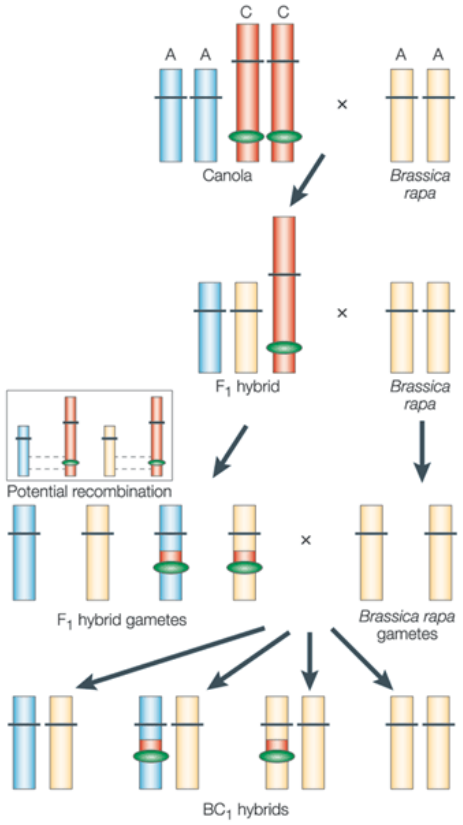


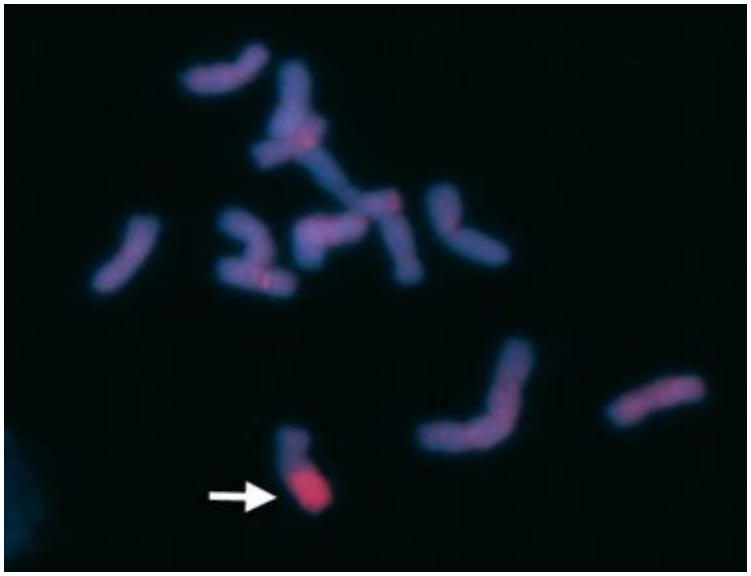
FIGURE 6-4: Hypothetical Rent Gradients and Land-Use Zones

c. Tribes diversity

d. Introgression

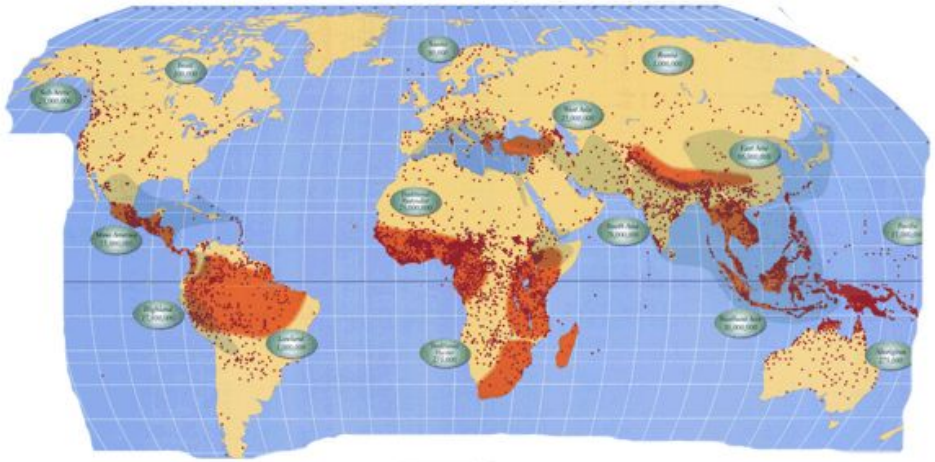




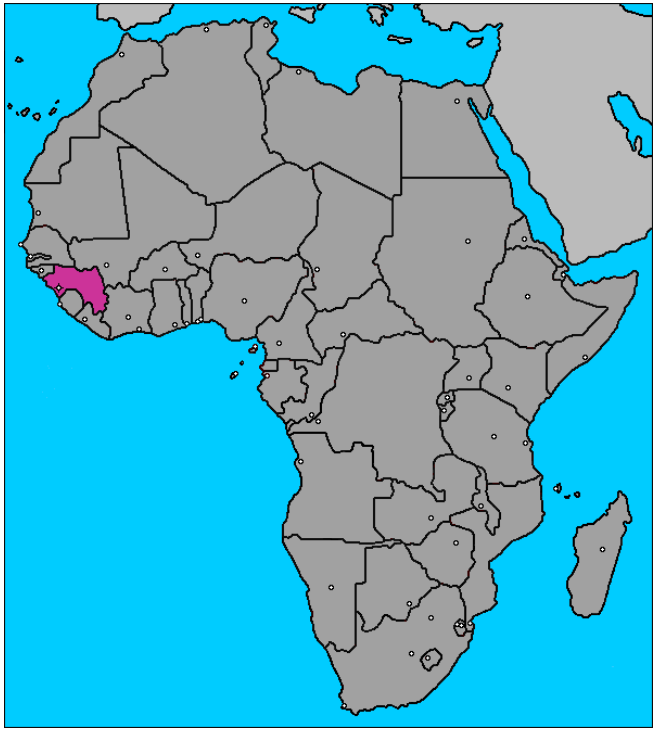


2. Geographic pattern

a. **Endemic**
b. **Semi endemic**
c. **Monocentric**
d. **Oligocentric**
e. **Nonecentric**



a. **Endemic: *Brachiaria deflexa* – Guine(Africa)**

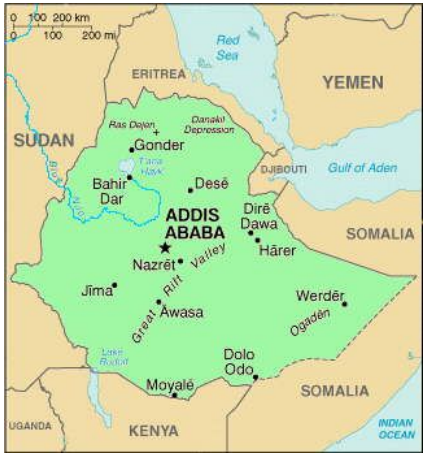
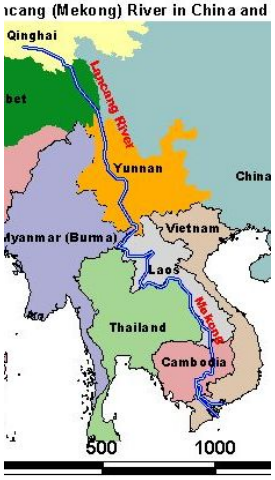
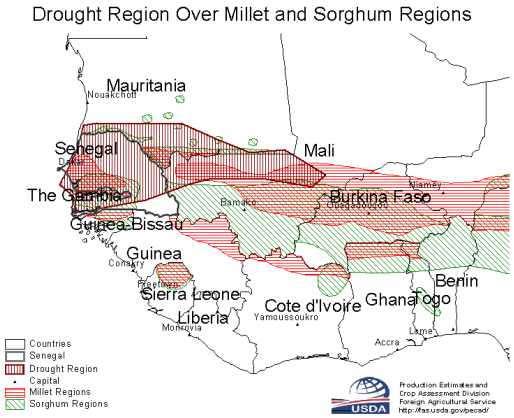


b. Semi endemic: *Eragrostis tef* (India)

c. Monocentric: Café, and rubber tree

(Não há secundário)

d. Oligocentric – Aveia, trigo, lentilha, etc.
(Há muitos centros secundários)



e. Nonecentric: Sorgo, banana