

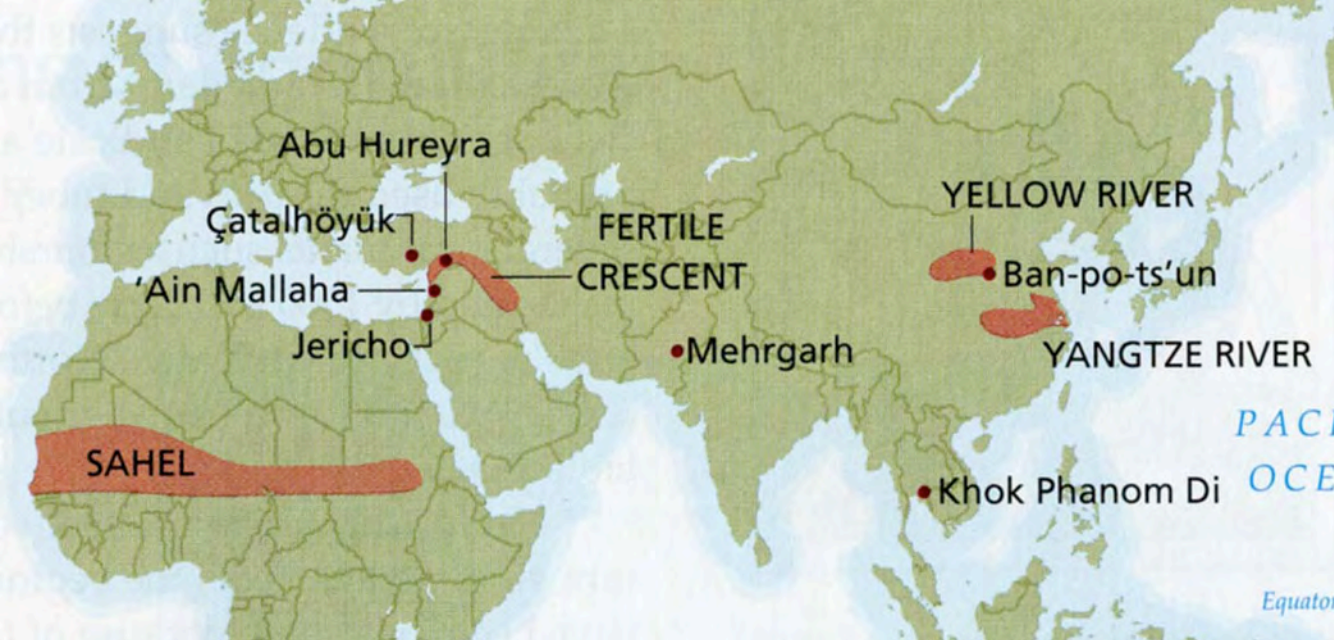
Agro Pastoral Lifeways

Epi-Palaeolithic/Mesolithic to Neolithic Settling Down (D. R. Harris 1978)

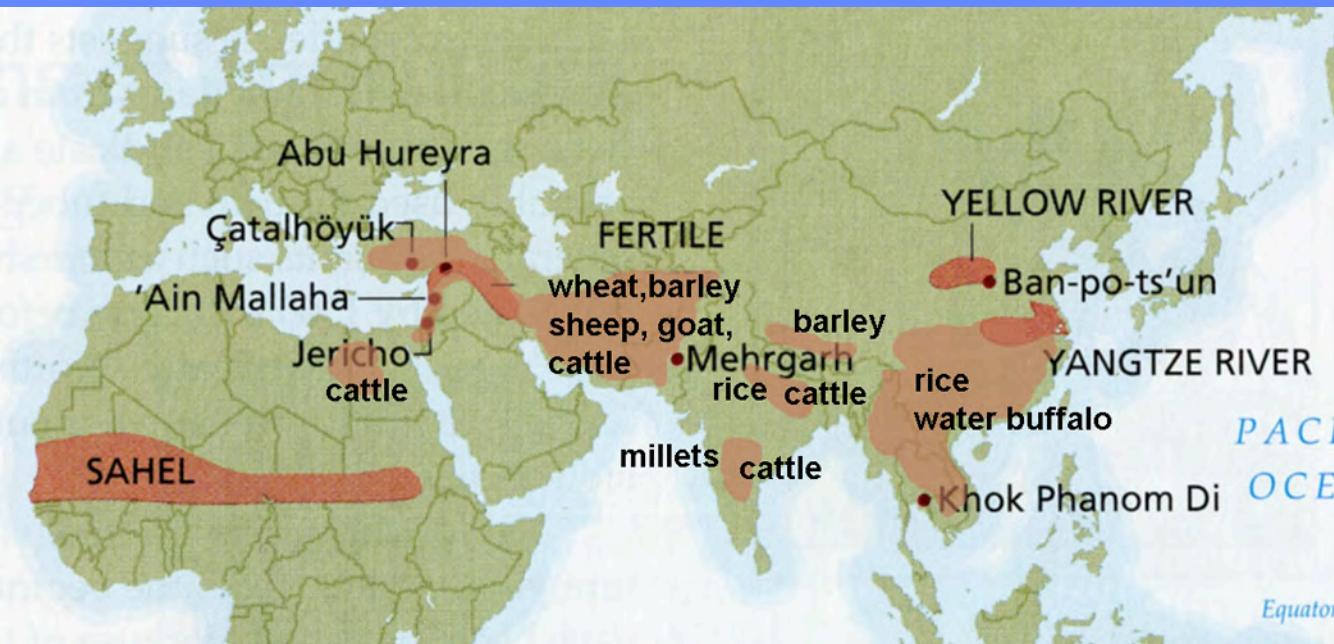
Why did human communities change from predominant dependence on wild plant/animal resources to domesticated plant/animal resources?



Fire-stick “farming” in Australia
- burning the underbrush to create grasslands for kangaroo
- easy hunting



Major regions of domestication as presented in most textbooks



Modified map based on new data and different interpretive models

Agro Pastoral Lifeways ; No single cause leads to domestication

The numerous variables include:

- 1) changes or features in the **natural environment**, the climate and available plants and animals
- 2) **human population** density - actual or perceived
- 3) the **subsistence patterns** that these communities adopt for survival - mobility or sedentism
- 4) the **technological** capabilities of a culture
- 5) the **social** organization of a culture
- 6) the **ideology or ritual** organization of a culture



Lake Zeribar, Zagros, Iran - pollen cores show evidence for climate fluctuations at the end of the Pleistocene - 12000 years ago

Climate Fluctuations

Late Glacial Maximum (LGM)
24,000 - 16,000/14,000 BP - entire region was cold and dry, but coastal hills had precipitation and forests

Younger Dryas - Decrease in precipitation from 11,000 to 10,000 BP

Increased precipitation around 10,000 -8000 BP (moister than today, but not as moist as at 11,500 BP)

The interrelationship of **four** major variables need to be examined and they are different for each major region

- **population** stability or change
- **mobility**- residential and logistic
- **socio-economic organization** - simple to complex

- **ideological perception of the environment** - what can and cannot be eaten

- Pork, Beef, Snake, Dog, Cat, Monkey etc



Population Change - mobile hunter-gatherer women usually bear children once every three years, while women in sedentary villages bear children **once every year** - leading to long term gradual population growth



But population growth alone cannot explain the transition to agriculture

Subsistence Patterns

change in dependence on resources from one or two primary resources that require long distance residential mobility



-to - **broad spectrum** local resources that require more logistic mobility and less residential mobility.

-**Sedentism** (lack of mobility

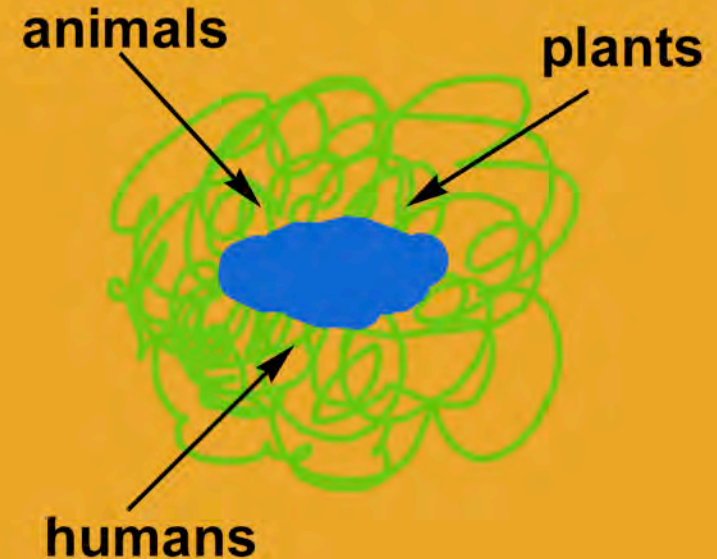
- population agglomeration to settlements where good resources are available leads to major population increase



Old Hypotheses

- monocausal
explanations focusing on
factors like environment
or population pressure

OASIS THEORY



NATURAL HABITAT HYPOTHESIS



For example,
Environmental Change
leads to concentration
of humans, plants and
animals

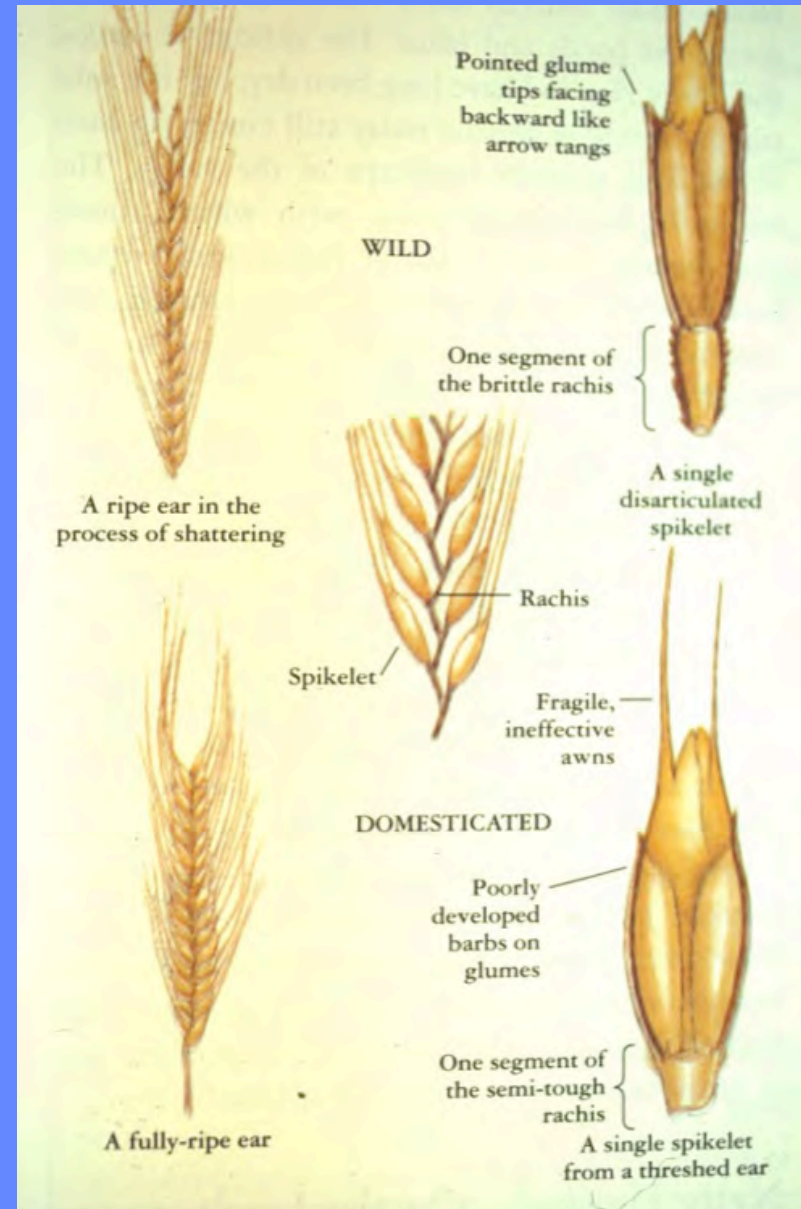
Edge Zone Hypothesis – population pressure makes some people move to less optimal areas – and they take along plants and animals, removing them from their natural environment - Binford

Resource Stress Model - areas of abundance allow sedentism, but not domestication - people living in resource stress zone go to abundant areas and bring back optimal plants and animals - attempts to increase reliability in stress areas would eventually result in domestication- Hayden

Other Explanations are more complex

major changes in models and interpretations for the Near East
M. Zeder 2011

- from one to multiple locations of domestication
- plants and animals were domesticated at about the same time
- many domestic animals do not lose their wild morphological attributes
- many wild plants have attributes that may look like they are domesticated



Domestication in West Asia and North Africa (Turkey to Iran, to Egypt)

Natufian Culture

10,000 to 8000 BC, specialized hunting and gathering settlements, semi sedentary, found from Turkey to the Nile River Valley

Early Natufian -base camps, semi subterranean huts, intensive and extensive collection of wild grain, hunting and gathering

Late Natufian - expanded over a much larger region from Mureybit to the Negev

- evidence of more **seasonal movement** - winter in the lowlands and summer in the highlands –leads to **removal of plants and animals** from one locality to the other



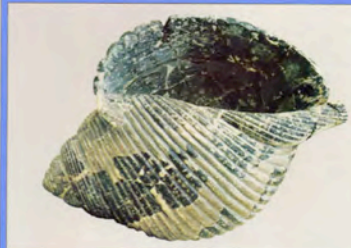
Mt. Carmel, Natufian, 9000 BC

Natufian harvesting tools



**Obsidian
trade areas
8000-5500 BC**

Obsidian trade



**Kebara Cave, Mt. Carmel,
Natufian sickle, 9000 BC**

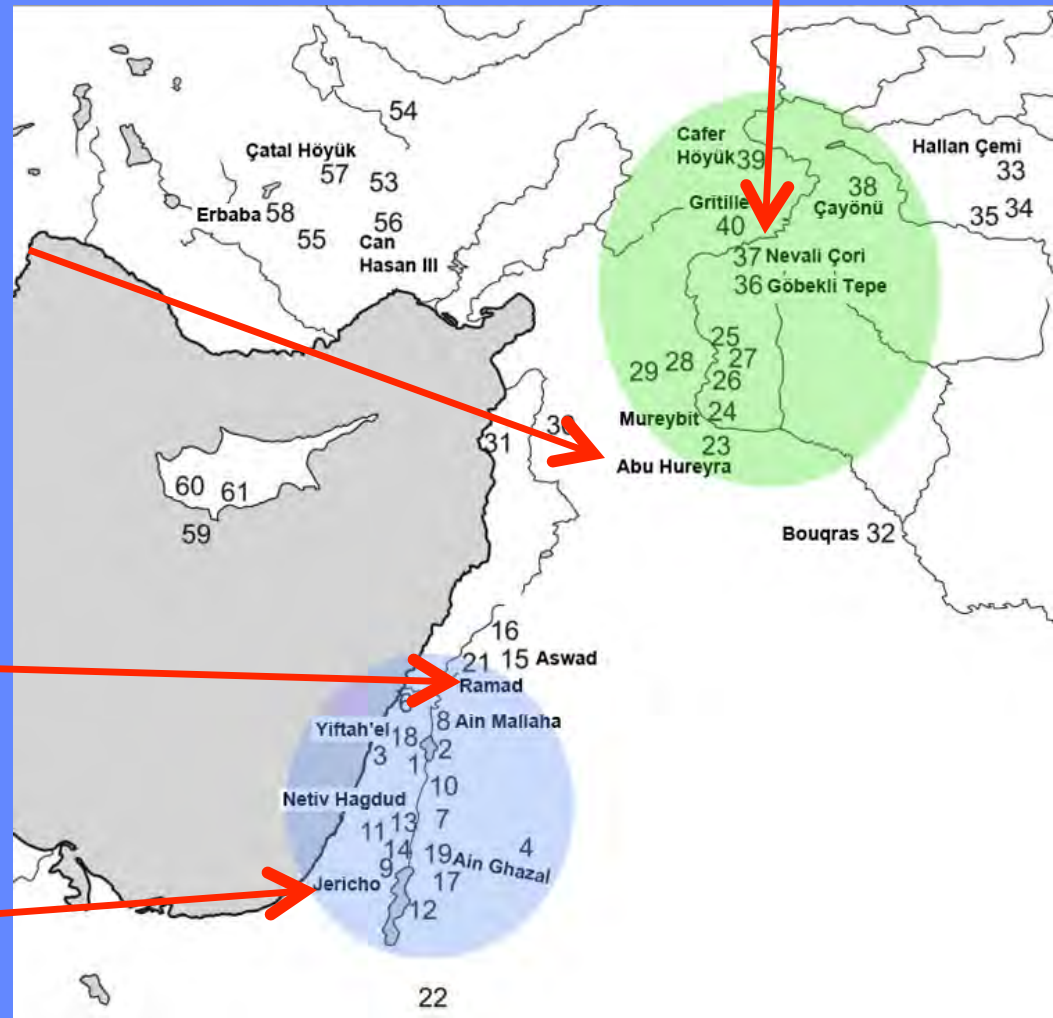


Abu Hureyra- 10,000 BC
– wild wheat, domestic
rye?, gazelle hunting,
small circular dwelling
pits – by 8500 -8200 BC
lentils, domestic wheat,
7600 BC domestic cattle
(*Bos taurus*), sheep/goat,
pig, site size increases,
evidence for long
distance trade of semi-
precious stones

Ramad 7500-6500 BC –
domestic barley

Jericho- 8500-7500 BC
Domestic wheat and
barley

Nevalı Çori 8500 -8000 BC –
domestic wheat and barley,
sheep, goat





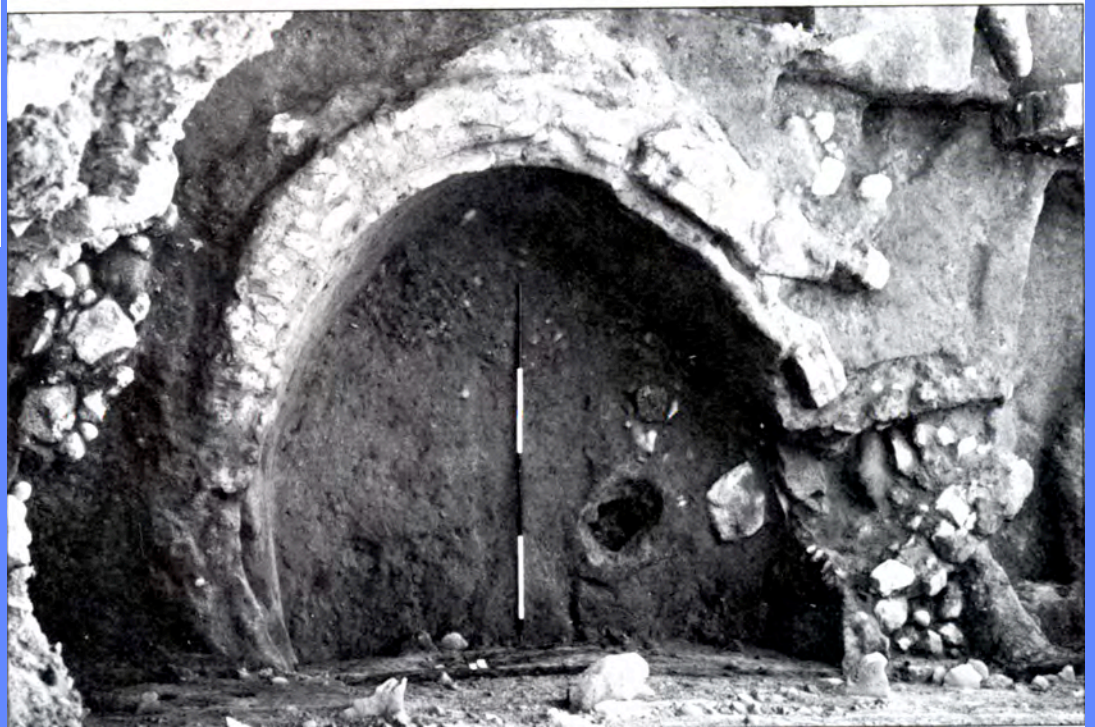
Jericho, Israel - 8350-7350 BC **Pre Pottery Neolithic A (PPNA)**

**Later site is
10 acres
4 hectares**

**8350-7350 BC - early evidence for
domestic grain, wheat and barley,
circular or rectangular mud brick
houses, stone tower and wall used
to protect settlement from floods**

**By 7500 BC cattle and by 7200 BC
– domestic sheep and goats in the
Levant**





Plastered
skull and
images

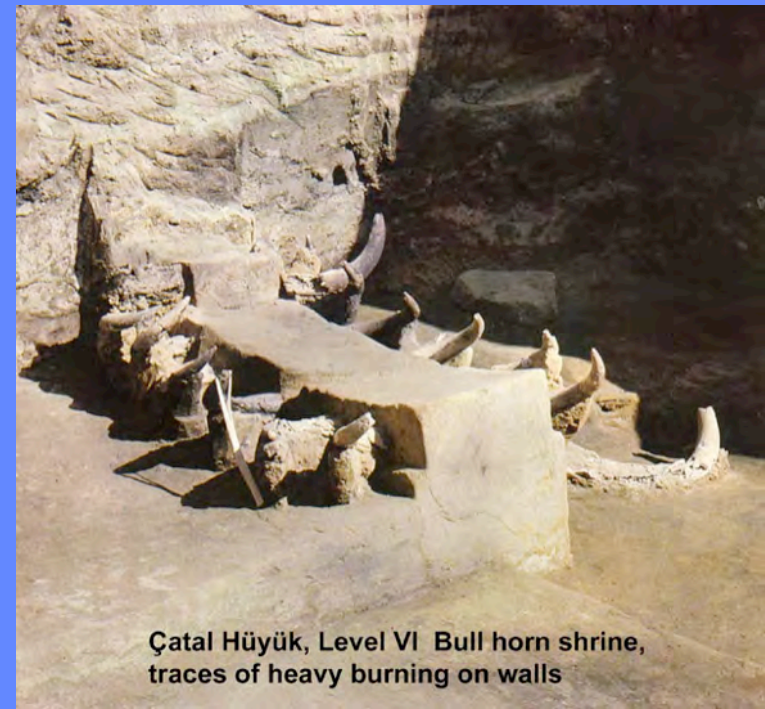
later square houses,
circa 7000 BC
Jericho, early circular,
semi-subterranean
huts (8000 BC),

Çatal Hüyük, Turkey -
ritual
and trade center,
7500-5700 BC.,
wheat and domestic
sheep, but not cattle





Large shrines with wild auroch cattle (*Bos primigenius*) horns and murals of mythical cattle, and hunters



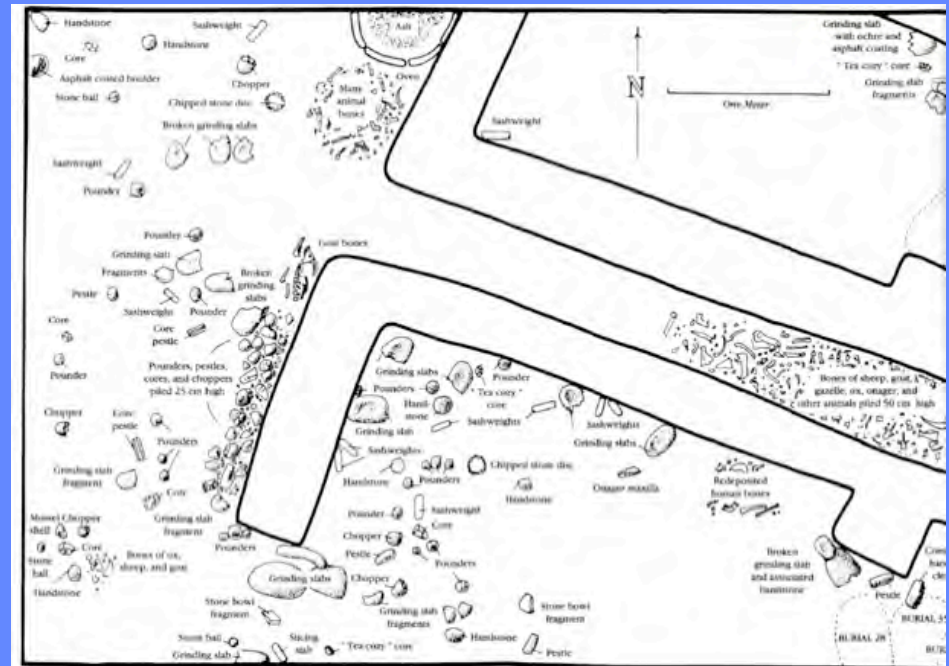
Çatal Hüyük, Level VI Bull horn shrine, traces of heavy burning on walls



Ali Kosh, SW Iran - 7500 BC- harsh environment, possible seasonal occupation of the site, winter cultivation, of emmer wheat and barley, summer hunting in the highlands, and some domestic goat located outside its natural habitat, mud brick houses,

Ganj Dareh, SW Iran - 7900 BC Domestic goat in a natural habitat area

By 7000 BC – domestic sheep in the Eastern Zagros, and cattle by 6500 BC



Possible **experimentation with domestication**, and reliance on grains in Nubia and Southern Nile.

- cattle bones from eastern Sahara sites, (7000-6000 BC

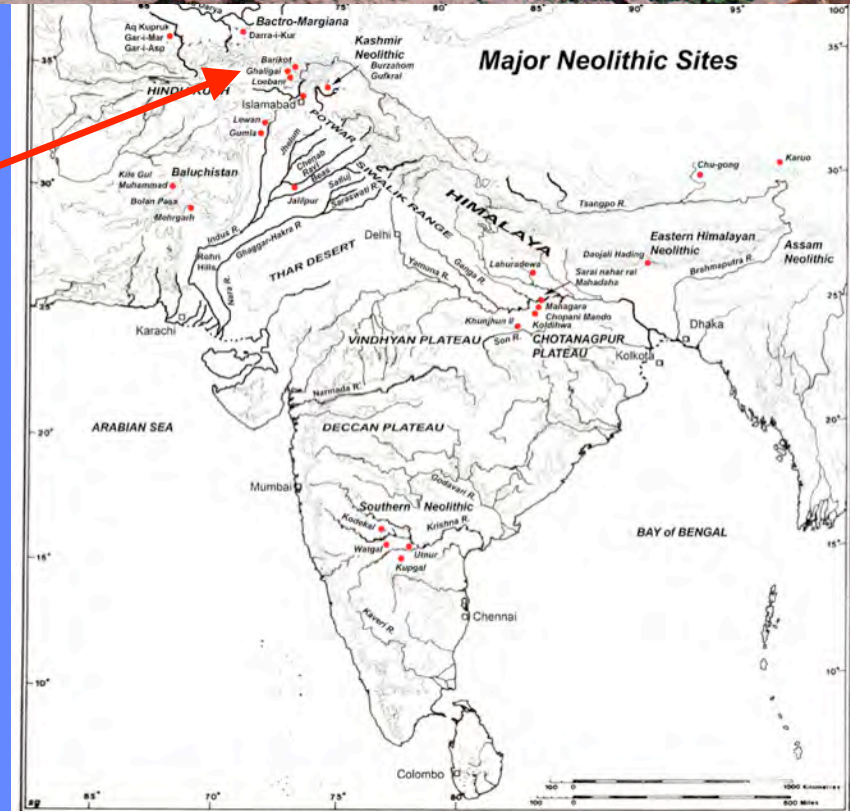


Tassili n' Ajjer, Algeria,
4000 to 3000 BC rock art
with herded cattle



wheat, barley - 7000 - 6000 BC
rice - 6500 BC
dates - +5500 BC ??
sheep/goat, zebu cattle,
dog - 7000 - 6000 BC
water buffalo, pig,
chicken - 2500 BC

- first evidence for domestic sheep and goat, still involved in hunting other animals and probably gathering of wild grains





Mehrgarh, Pakistan

- 7000 or 6500 BC
seasonal settlement at
the base of a pass
-transition from
dependence on hunted
to domestic animals
and plants



Sickle with
microliths
and bitumen



Mehrgarh, Pakistan

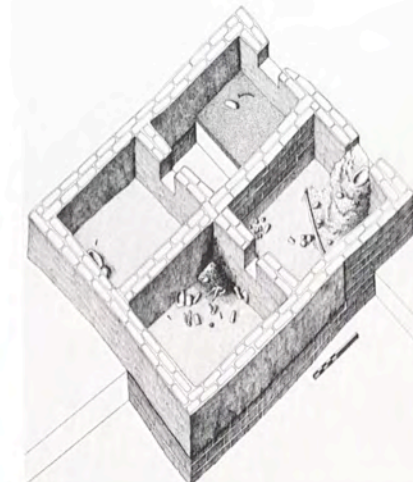
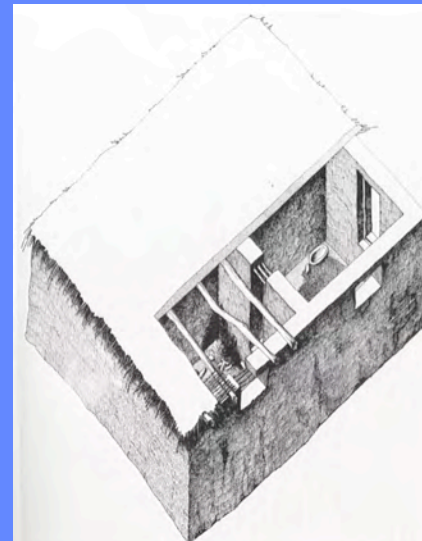
mud brick houses, burials with ornaments traded from great distances, domesticated plants and animals, including **barley**, **wheat**, **cattle (zebu - *Bos indicus*)**, **sheep and goats**.



Wheat and barley impressions in mudbrick



Lapis lazuli, turquoise, and marine shell beads



Central Ganga Valley, India

Lahuradewa, 6300 BC Rice, 2700 BC Barley

Koldihwa, 7000-5000 BC - circular huts, cattle, domestic rice, ground stone adze/axes, various types of pottery



**Rice
6300 BC**



**Barley
2700 BC**



Chicken – domesticated in the Indus valley (2500 BC?) from the red jungle fowl that ranges from the foothills of the Himalayas (also as far as Sumatra)

Claims for separate domestication in China (6000 BC) or Southeast Asia are not confirmed



Chicken
figurine
Harappa,
2000 BC



Domestic chickens India

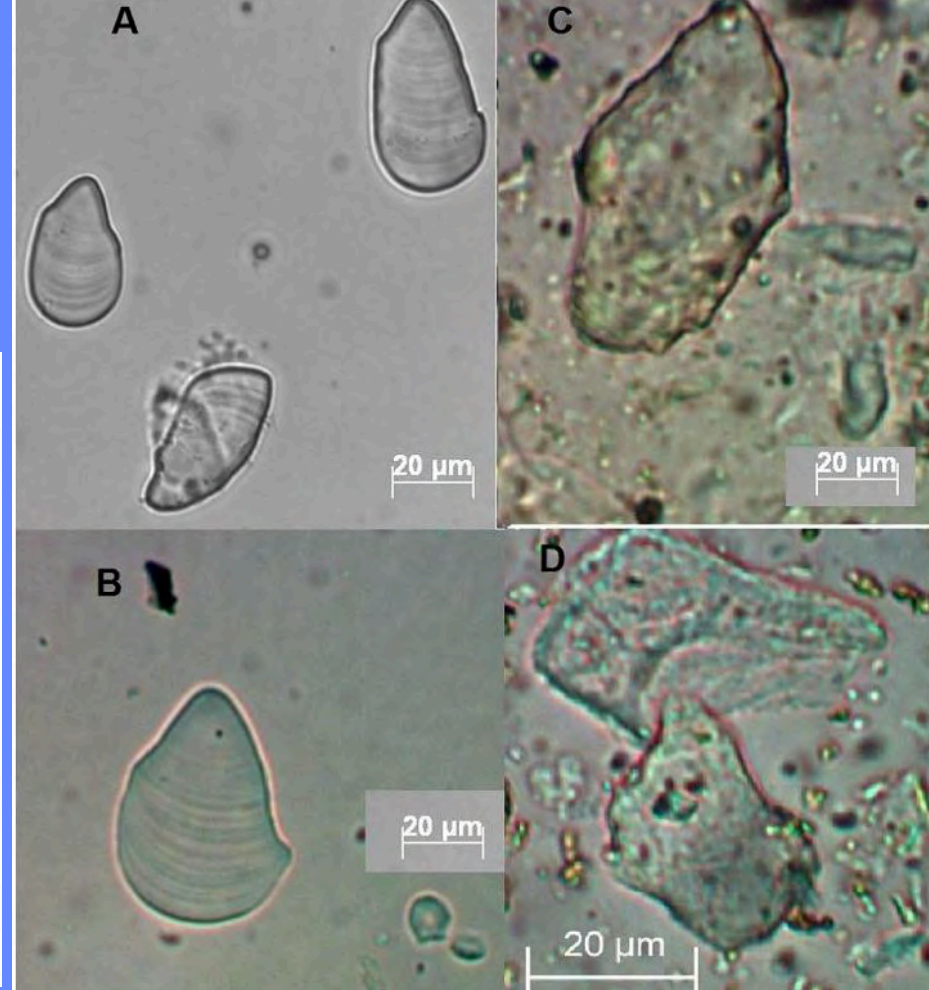
Harappa – cattle mandible sampled for starch in the calculus

- Show wheat, barley, millet, turmeric, ginger and eggplant starches – all cooked



H90/3065-45 Harappa street deposit in Mound E South, Teeth: M/2 and M/3 showing tan dental calculus overlying white dental enamel *Slide courtesy A. Kashyap*

Turmeric: *Curcuma* sp.
- The yellow spice used in curries



A. Elongated triangular starch grains from modern *Curcuma longa*; B. Ancient starch cf. *Curcuma* sp., from cow mandible; C, Modern, cooked starch grains from *C. longa* (cooked for 30 minutes); D, Ancient cooked *Curcuma* sp. Slide courtesy A. Kashyap



Cotton (*Gossypium arboreum*), first domesticated in the Indus region and then spread to the rest of the old world

– ***G. herbaceum*** – native to Southern Africa and Arabia



Spinning cotton
in Pakistan

Longer fiber New World cottons
– ***G. hirsutum*, *G. barbadense*** – have now replaced most Old World cottons

China 8000-5000 BC

rice - 8000-5000 BC

millet - 8000 BC ? 5500-5200 BC

pig - 5500-5200 BC

water buffalo - 5500 BC ?

Southeast Asia 3500 BC

rice - 3500-2500 BC

water buffalo 1500 BC



North China -
Peiligang Culture, central
Huang Ho river valley - 8,000
BC - first transition to
intensive use of plants,
mortars and pestles, - **foxtail**
millet (*Setaria italica*), and
later sites have **Broom corn**
millet (*Panicum miliaceum*)
- new discoveries of early
rice at **Cishan** (8,000) and
Jiahu (7000-5000 BC)



**Fox
Tail**

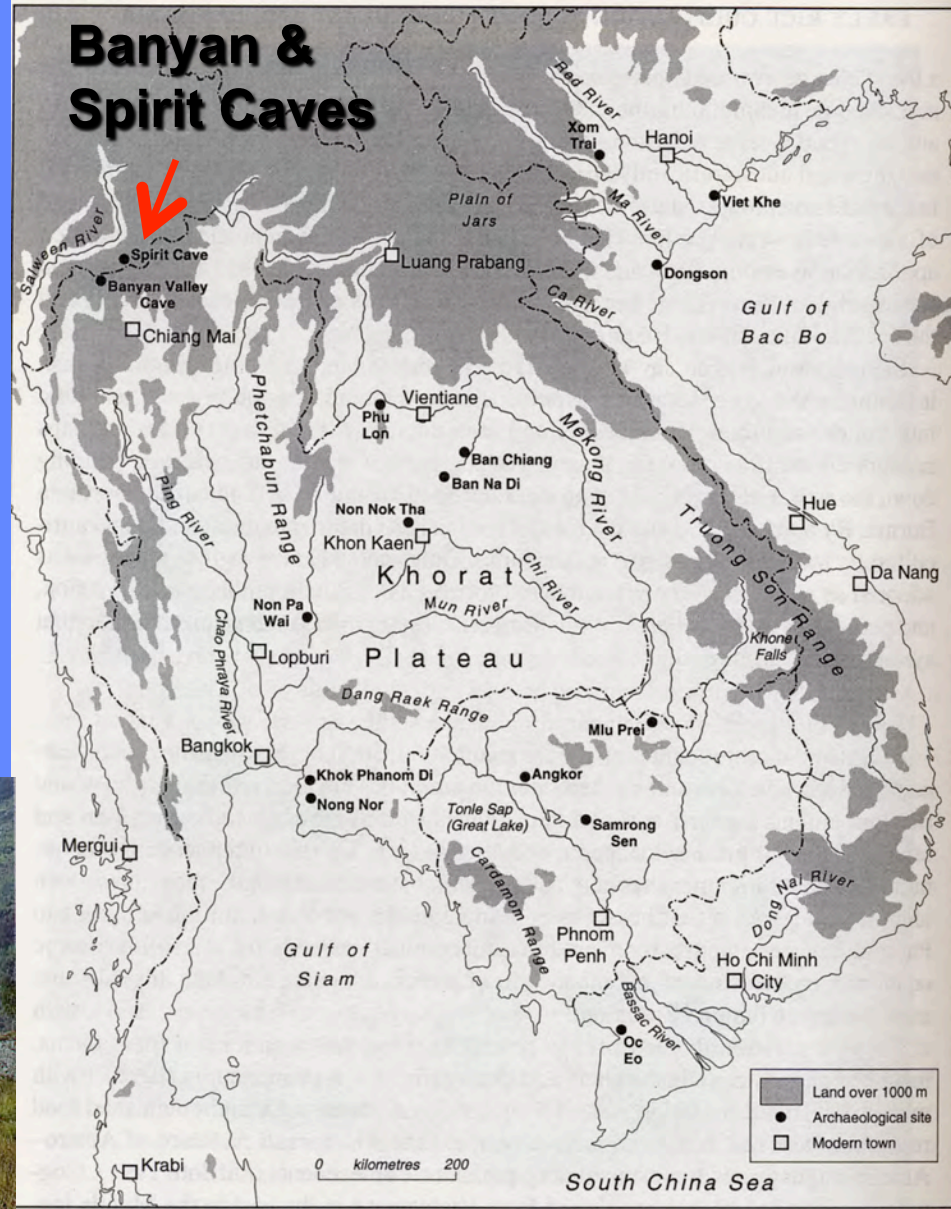


**Broom
corn**

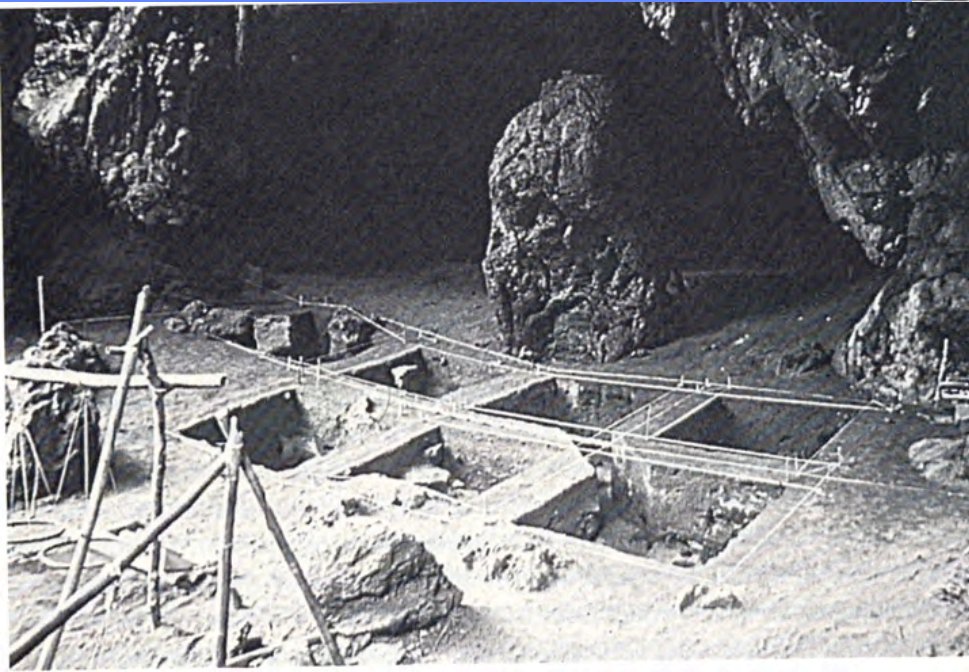
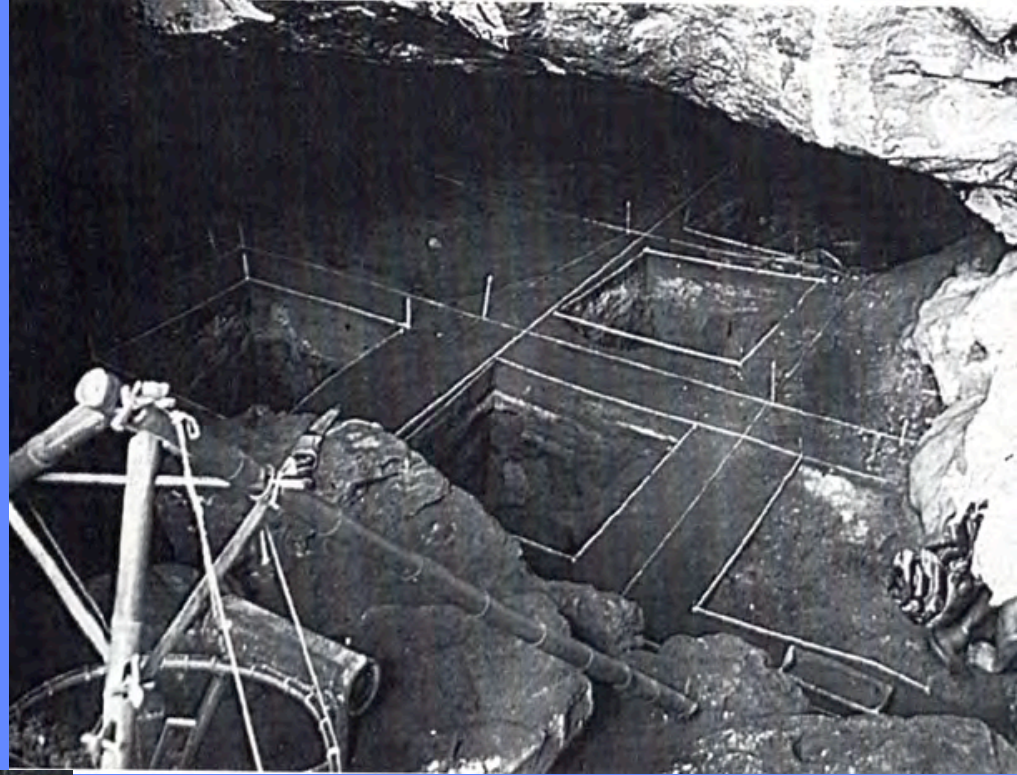


Southeast Asia Hoa Binh Culture

- 9,000 BC to **1000 AD** -
broad based foragers,
lived in caves and low hilly
terraces, also some
coastal sites, seasonal
plants including **wild rice**,
yams, beans and peas



Spirit Cave, Thailand -
8500 - 5500 BC -
Hoabinhian culture,
beans, peas, yams, **wild**
rice, pottery in later levels.



Banyan Cave, Thailand -
3500 BC use of **domestic**
rice , continued to be
occupied till quite recently,
AD 900



Mesoamerica

7000-3000 BC

maize - 3000 BC

squash - 7600-3500 BC

chenopodium - ?

Turkey - 3000 BC?

No draft or milk animals

NEW WORLD DOMESTICATES

Guadalajara region -
Teosinte - ancestor of
maize in highlands of
Mexico



Tehuacan Valley San Marcos and Coxcatlán Caves

- 2700-2600 BC - maize (Zea mays), wild foods still dominate at first
- but trace elements in bone show increase in consumption of grains after 1000 BC

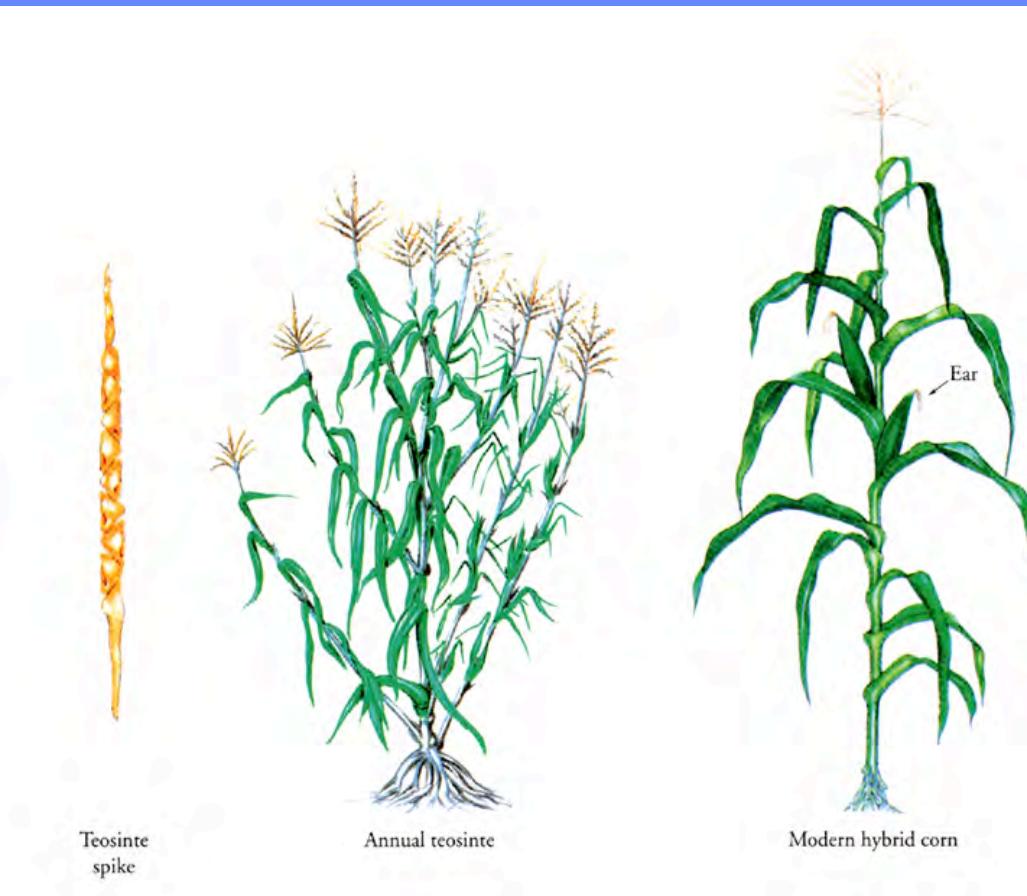


maize phytolith

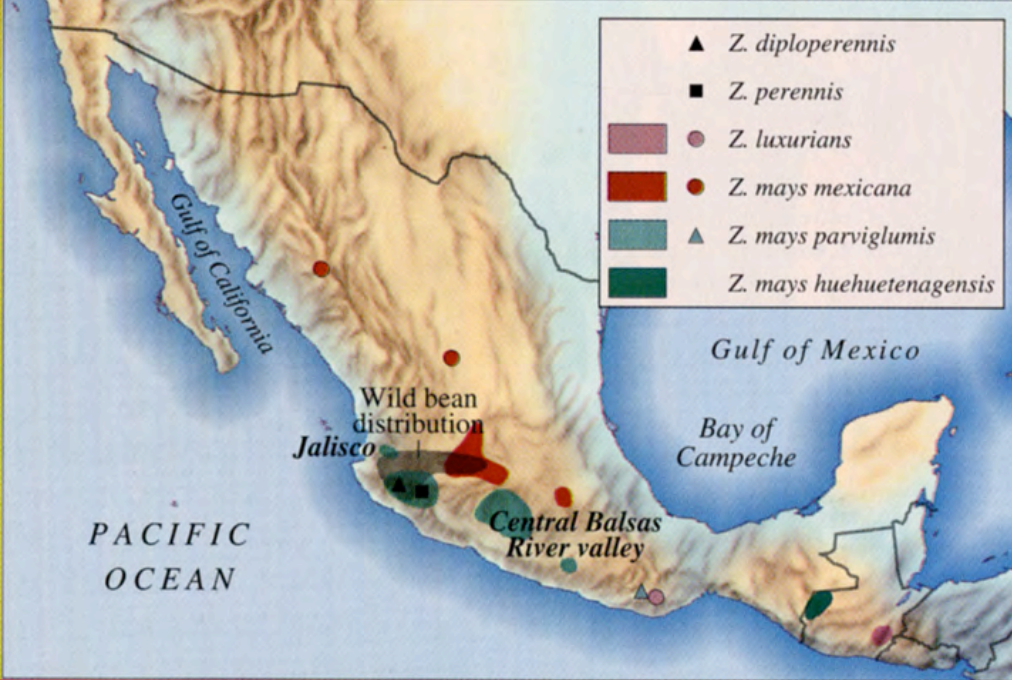


- by 1000 BC evidence for **avocado, chili pepper, squash, bottle gourd**, - stone tools, points, stone bowls, grinding stones and pestles, pebble choppers
- around **285 BC common bean** (note that bean appears long after maize)

Maize spreads out of SW Mexico to **Pacific and Gulf Coasts by 1500-1400 BC** and to South America and the Southwestern U.S. by around **1200 BC**



Varieties of domestic maize



Common Bean and Lima Bean - **domesticated independently** in S. America and Mesoamerica, based on protein signatures

Wild, domestic and stringless bean pods

Meso-America

Lima beans - 1500 BC,
Common beans - 300 BC

South America

Lima beans - 5000 BC
Common bean - 2300 BC first domesticated in higher elevations and then spread to the coast





Wild gourds from Mexico, and wild ancestor of domestic squash from Arkansas (*Curcubita pepo* subsp. *ovifera* var. *ozarkana*)

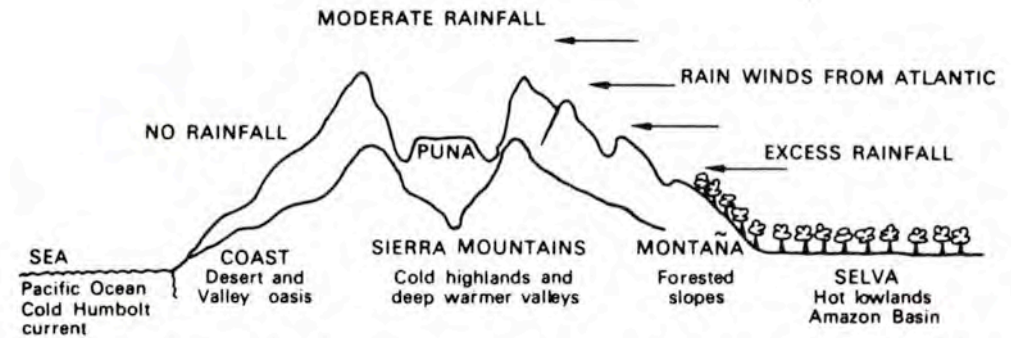
Guilá Naquitz -

7600-6900 BC earliest domestic squash, by 5700-5000 BC, larger squash seeds indicate phenotypic change,



South America

3 major regions of vertical and horizontal diversity



Narrow coastal strip, desert, intersected by over 50 rivers, agricultural land, foothills

Highlands - fertile intermontane valleys,
Potato - 8,000 BC ?
3000-1200 BC
Quinoa - 3000-2000 BC
(Chenopodium)



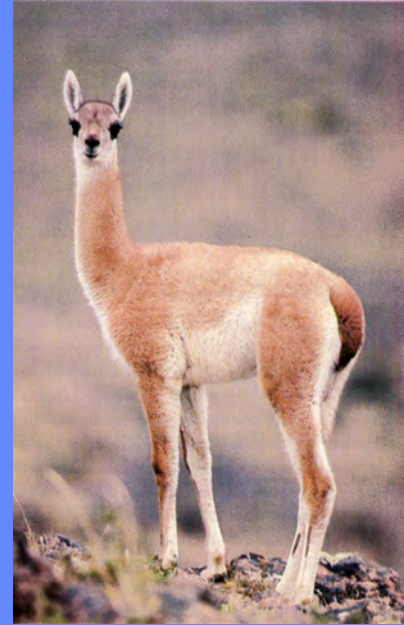
Peru

Llama / alpaca -

3000 - 2000 BC

Guinea pigs -

2500 BC



**Ancestral wild
Guanaco**



Panaulauca Cave,
Lake Junin area, 2500
BC - domesticated
quinua, domestication
of camelids , Llama
(Lama glama) and
Alpaca (Lama pacos)

Casma Valley,
Peru - 2000-1200
BC - four sites
with early potato

Tres Ventanas,
Peru - 8000 BC?
3000-2000 BC -
potato, high
Andes,

South American
tubers, oca, ullucu,
mashua

