

# 1. Domestication

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Questions are related to the article:

***Patterns and processes in crop domestication: an historical review and qualitative analysis of 203 global food crops***

*R.S.Meyer, A.E. DuVal and H.R. Jensen, New Phytologist (2012)*

doi: 10.1111/j.146-8137.2012.04253.x

## 1 Introduction

Second paragraph: What kind of information, named categories, is compiled of the 203 crop plants in the article? Name 5.

### 1. Historical context

In the second alinea the authors describe that molecular technologies are used to test and apply theories of crop origins. Can you give a description of the technologies used?

For an example see video 'Popped Secrets'.

## 2 Key concepts and definitions

### 2. Reproductive strategy

In nature plants have often more than one reproductive strategy such as sexual breeding systems (outcrossing or self-fertilizing) and asexual strategies (vegetative or clonal propagation). Under cultivation only one of these strategies is usually exploited, Why?

How can you make an inbred line?

How can you make an F1 hybrid line?

### 3. Domestication syndrome

Name some of the traits that are described under the term: Domestication Syndrome.

(see also assignment: 10 CROPS that look totally different) Name at least 5 traits.

### 4. Degree of domestication

Can you give an example how artificial selection can work in opposition to natural selection?

### 5. Center of domestication

What are the eight centers of origin (centers of domestication) described by Vavilov?

Can a crop species have multiple origins? Explain and give an example of the many forms of *Brassica oleracea*.

**Table 1 in the article contains 203 crop species that were domesticated and reviewed in this article.**

**Choose one of these species for your own project.**

**You can work in pairs.**

## 3. Methods of review and analysis

*This section gives background information on the selection of the species, background literature and data analysis used in the article. Not used as exam material.*

**4. Trends identified from the review of 203 crops.**

Are crops still being domesticated these days? Give definition of domestication.

How many domestication syndrome traits can you find on average in a crop?

**5. Life cycle**

Annuals are the first plants that were domesticated (9000-400 years ago), with corn, wheat, rice as main examples.

**Table 2** gives a nice summary of the species in each category of information.

To what classification belong our 3 major crop species?

What is their life cycle? Ploidy number? Centre of domestication? Domestication traits? Use?

How do these categories compare to Table 2

	Corn	Wheat	Rice	Table 2
<b>Classification (mono/dicot)</b>				
<b>Life cycle</b>				
<b>Ploidy number</b>				
<b>Centre of Domestication</b>				
<b>Domestication traits</b>				
<b>Use</b>				

Biennials occur later as domesticates around 3000-1000 years ago and their centres of origin are around circumboreal floristic regions (circumboreal climate). Why?

Give 3 examples of a biennial crop. What plant parts are used?

New domesticates are trees, that were domesticated the last 2000 years and this is mainly caused by a change in their reproductive strategy. How are trees propagated?

What do we eat from trees?

What are the main domestication traits in trees?

Why is the number of domestication traits in perennial fruit crops (trees) lower than in annual seed crops? (See also Tabel 3 for annual seeds crops)

**6. Poidy Level**

What traits are associated with polyploidy?

What is the difference between allo- and auto-polyploidisation?

What other advantages can a polyploidisation event have for domestication of a plant? Nam

What effect can polyploidisation have on the reproductive strategy? Do you know an example?

**7. Reproductive strategies**

How can you propagate a fruit with no seeds? Can you give an example?

How can you make a fruit with no seeds?

## **8. The Domestication syndrome**

What is the most common domestication syndrome trait? Give example

What are the other important domestication traits? Give examples

## **9. Spatial and temporal trends**

*This section gives background information on global domestication processes. Not used as exam material.*

## **10. Utilization of plant parts**

Some food plants were originally exploited for other purposes than food. Give some examples of these plants and their uses.

Name some new uses of (food) plants.

Explain how plants originally domesticated for their edible seeds have new, additional uses today.

There is a strong connection between plant uses as food and medicine.

What percentage of food crops sampled in this study are used for medicinal purposes?

What number of crops were initially used as medicine but later incorporated into the diet as food? Give examples.

## **More information on plant breeding?**

Plant Breeding: Concepts and Methods

<https://www.integratedbreeding.net/courses/plant-breeding-concepts-and-methods/index-id=002.php.html>