



The influence of physical and chemical factors on the development of common bean seeds.

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Taxonomy of the Common Bean

Kingdom

Plantae

Phylum

Magnoliophyta

Class

Magnoliopsida

Subclass

Rosidae

Order

Fabales

Genus

Phaseolus

Family

Fabaceae

Subject

Phaseolus vulgaris L.

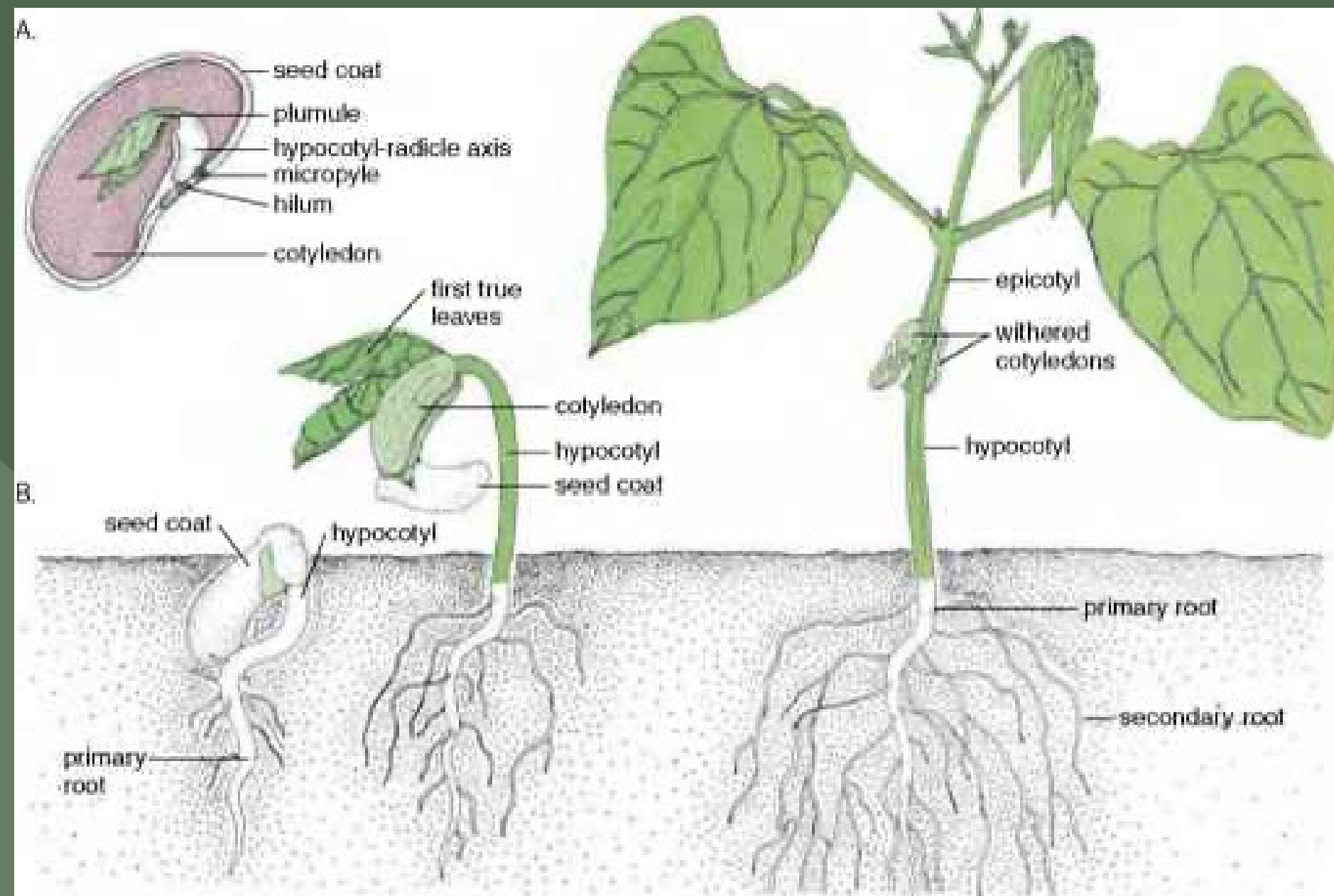
Biological Features of Common Bean

Dicotyledonous

Angiospermic

Self-pollinating

Morphological structure of common beans



Varieties and Nutritional Value of Common Beans

source of:

- protein (100g provides approximately 21-25g)
- dietary fiber
- vitamins, especially from the B group
- folic acid
- minerals

Goal of my project

investigate how various
physical and chemical factors
affect the germination of beans

MY THESIS

The best result, both in terms of seed germination speed and the healthy state of the germinating plant, will be achieved in the control group.

Alkaline pH



●
Day 1

To obtain alkaline pH, I added baking soda to water, obtaining pH 9.



●
Day 6

The seed started to root.



●
Last day

The seed rotted even further and did not develop.

Acidic pH



Day 1

To achieve acidic pH, I added spirit vinegar to water, obtaining pH 3.



Last day

The seed did not develop, and there were no changes observed.

Low temperature



Day 1

On the first day the bean, was placed outside, but due to negative temperatures, the water froze, so I placed it by the window, where the temperature was below zero outside.



Day 5

The seed began to germinate, and the white coat started to detach from the seed.



Day 10

A shoot began to develop.



Last day

The seed sprouted and produced a shoot but did not develop lateral roots.

High temperature



Day 1

The bean was placed on a radiator with access to light



Day 5

The seed began to germinate.



Day 8

The root began to dry out and stopped growing.



Last day

A shoot began to appear.

Lack of light



Day 1

The bean was placed in a closed cupboard.



Day 4

The bean began to germinate but at the same time, mold appeared on the seed.



Last day

The mold continued to grow, and the bean did not produce roots or shoots.

Control trial



Day 1

The bean was kept at room temperature, with access to light, and in water with a neutral pH.

Day 8

The seed began to germinate.

Day 10

The coat started to detach.

Day 11

The root elongated, lateral roots began to form.

Day 12

The bean developed a shoot.

Last day

The bean developed long roots and a shoot.

Conclusions

The control group showed the best development. The seed developed the longest roots and shoots, and no changes such as mold appeared on it.





Thank you
for your
attention.

Bibliography

- http://www.inhort.pl/files/program_wieloletni/PW_2015_2020_IO/spr_2020/3.4_Janas_Metodyka_Instrukcja_fasola.pdf
- <https://www.sofra.com.pl/blog/fasola-wlasciwosci-witaminy-kalorie-jakie-sa-rodzaje-fasoli?fbclid=IwARI5kkfSVjNwVA0mlwIzNqzBJQJuV4ih3BHH9Fov73LTQ-nW0mzxGfvTHdl>
- <https://www.invasive.org/browse/subinfo.cfm?sub=9541>
- <http://milakehomegarden.blogspot.com/2016/01/how-when-to-pot-seedlings.html?m=1>