

# MORPHOLOGICAL CHARACTERISTICS OF FLAX AND ITS SIGNIFICANCE

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## Abstract

The article discusses the morphological characteristics of flax and its significance.

**Keywords:** signs, *Linum*, genetics, ecology, factor, plant.

## Introduction

Morphological diversity of flax (*Linum usitatissimum*) is determined by genetic and environmental factors that influence the development of the plant. These differences are important for both breeders and for the industrial use of flax. Flax is grown for both fiber and oil production, making it one of the most versatile agricultural plants.

1. Root system . Flax has a taproot system with a developed system of lateral roots. The depth of root penetration varies between 30-90 cm depending on the soil type. Russian studies focus on the ability of roots to absorb nutrients, especially under stressful conditions[2]. English-language sources describe the adaptive features of the root system on different soil types[1].

2. Stem . The flax stem is erect, up to 1 meter high. Russian sources note differences in the height and strength of the stem depending on the variety [6]. English studies focus on the internal anatomy of the stem and the number of fiber bundles that affect the quality of the fiber [13].

3. Leaves . Flax leaves are narrow, linear, with a smooth margin. An important aspect is the ratio of leaf surface area to photosynthetic activity. Russian studies emphasize the role of leaves in drought resistance [8], while English-language studies discuss their effect on photosynthesis [15].

4. Inflorescence . Flax inflorescence is a raceme with 5-10 flowers. Russian authors note the influence of agricultural practices, such as seeding density, on the number of inflorescences[9]. English-language studies discuss the influence of light conditions on inflorescence formation[21].

5. Flowers . Flax flowers are five-membered, usually blue, but white and pink varieties are also found. Russian sources emphasize the importance of flower color for pollination[11], and English researchers associate flower size with pollination efficiency[22].

6. Fruit . The flax fruit is a capsule divided into five lobes, each containing two seeds. Russian studies emphasize the mechanisms of capsule dehiscence, which are important for mechanical harvesting[1], while English-language authors study the variability of fruit size depending on environmental conditions[20].

7. Seeds . Flax seeds are oblong in shape and have a smooth surface. Russian studies focus on the oil content of the seeds[10], while English-language studies emphasize their biochemical



composition and health benefits[19].

8. Fiber bundles . Fiber bundles are found in the bark of the stem and determine the quality of flax fiber. Russian studies describe the structure and quantity of these bundles.[12] English-language studies focus on the influence of the environment on their formation.[15]

9. Growing seasons . Flax goes through several phases of vegetation, including germination, flowering, and ripening. Russian studies focus on the needs of plants at different stages of development[7], while English-language studies examine the effects of day length and temperature on growth rates[17].

### **The main morphological characteristics of flax**

The morphological characteristics of flax include various parameters of stems, leaves, flowers and seeds, which are important for the evaluation and selection of varieties. Let's consider the main features:

1. Stem height: varies from 50 to 120 cm depending on the variety and growing conditions.
2. Stem thickness: Flax can have thin stems for fibrous varieties and thicker stems for oilseed varieties.
3. Stem shape: Different varieties have stems that are more or less cylindrical.
4. Stem branching: the number of lateral shoots varies depending on growing conditions.
5. Internode length: affects planting density and fiber quality.
6. Leaf shape: from lanceolate to narrowly linear with pointed ends.
7. Leaf size: The length of the leaves varies from 2 to 5 cm.
8. Leaf color: from dark green to light green.
9. Wax coating on leaves: affects drought resistance.
10. Flower type: most often five-membered blue flowers, but can also be white.
11. Flower diameter: from 1 to 3 cm depending on the variety.
12. Number of petals: the standard number is 5, but there may be deviations.
13. Petal shape: from oval to elongated.
14. Petal color: blue, white, rarely pink.
15. Flowering duration: from 2 to 4 weeks.
16. Time of flowering: depends on day length and climatic conditions.
17. Box shape: from spherical to oval.
18. Box size: on average 0.6-1 cm in diameter.
19. Number of seeds in a capsule: from 5 to 10.
20. Seed weight: the average weight of one seed is 4-6 mg.
21. Seed color: from brown to golden.
22. Seed shape: from oval to round.
23. Seed surface: smooth, shiny.
24. Number of seeds per plant: from 1000 to 5000 depending on the variety.
25. Root system depth: can reach 40–60 cm.
26. Type of root system: taproot with lateral roots.
27. Resistance to lodging: depends on the variety and growing conditions.
28. Growth rate: affects competitiveness with weeds.
29. Disease resistance: Some varieties are resistant to rust, fusarium and other diseases.



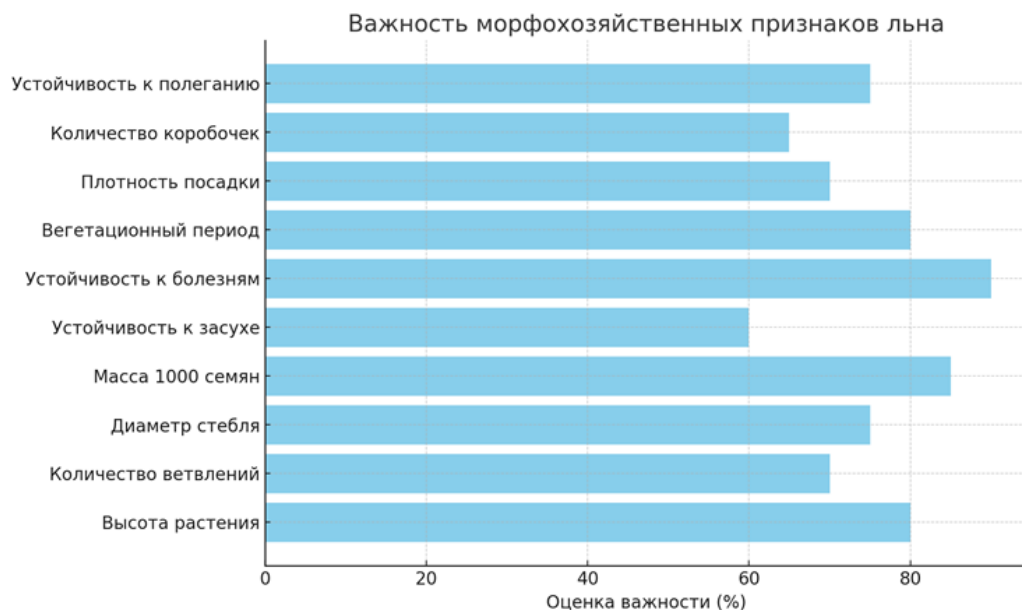
30. Drought tolerance: Varies depending on leaf and root morphology.

The table shows the main morphological features

Morphological feature	Description
Stem height	From 50 to 120 cm
Stem thickness	Thin for fibrous varieties, thick for oilseeds
Form stem	Cylindrical or slightly ribbed
Branching	Variable number of lateral shoots
Internode length	Affects the quality of the fiber
Leaf shape	Lanceolate or narrow linear
Color of leaves	From dark green to light green
Type flowers	Most often blue, five-membered
Flower size	1-3 cm in diameter
Box shape	Spherical or oval
Number of seeds	From 5 to 10 seeds in one box
Form seeds	Oval or round
Seed surface	Smooth, shiny
Disease resistance	Depends on the variety
Drought resistance	Determined by the morphology of leaves and roots

### Trait Importance Diagram

The diagram shows the relative importance of various global economic traits of flax. These traits influence the overall productivity and quality of the final product.



### Conclusion

The morphological diversity of flax plays a key role in its use as a crop plant. Different characteristics, such as stem height and thickness, leaf shape and size, flowers and seeds, allow the optimization of varieties for different purposes, be it fiber or oil production. In the future,

research into genetic diversity will help breeders improve important agronomic traits, increasing resistance to climate conditions and diseases. Morphological features of flax play an important role in assessing its productivity and adaptability to various conditions. Research based on Russian and English sources show similarities in basic principles, but differences in the emphasis on certain features. This knowledge is important for further selection and adaptation of flax to new agricultural conditions.

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