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## **MORPHO-BIOLOGICAL FEATURES AND TECHNOLOGY OF GROWING ASPARAGUS**

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### **ABSTRACT**

Asparagus, better known as asparagus, is a perennial that grows mainly in dry climates. There are about 100 types of asparagus, but some sources mention the presence of 300 types of asparagus. Asparagus, which is familiar to many, has a high taste, which is grown in the form of a shrub or grass. The upper part of the young shoots of this vegetable is included in various culinary delights. However, only 20 types of asparagus are suitable for food. The article notes the nutritional and healing properties, how to use them, and provides information on the history of asparagus and chemical composition. A brief morphological characteristic of asparagus, its relation to environmental factors is given. The technology of growing asparagus is described in detail: seed preparation for sowing, site selection, soil preparation, fertilizers, methods of growing crops, care and harvesting measures.

### **KEYWORDS**

Asparagus, chemical composition, use, morphological features, biological properties, agricultural technology, harvest.

### **INTRODUCTION**

Asparagus is a perennial plant of the asparagus family (Asparagaceae), a delicacy vegetable crop, also used as an ornamental plant. It grows wild in Eurasia (except for the North); in Russia - in the European part, in the North Caucasus, in Western Siberia, in Altai. Asparagus

was introduced into culture more than 4 thousand years ago, probably in the Mediterranean. Since the 15th century, it has been grown in France and other European countries. Since that time, it has been known

in Russia, but has not been widely spread. Widely cultivated in Western Europe and the USA.

According to the chemical composition, asparagus is one of the most valuable vegetable crops. Bleached asparagus shoots contain on average: water – 91,7%, nitrogenous substances – 2,5%, sugar – 3,6%; fiber – 0,72%; ascorbic acid – 13,7 mg per 100 g. It is noteworthy that from 60 to 80% of nitrogenous substances in asparagus are accounted for by protein nitrogen. Asparagus is valuable for its mineral composition. Asparagus shoots contain (mg per 100 g): sodium – 40,0; potassium – 207,0; magnesium – 20,0; calcium – 21,0; iron – 1,0; phosphorus – 46,0; iodine – 10,0. The nutritional value of asparagus is also determined by the presence of a whole complex of vitamins in it. Along with ascorbic acid, it contains vitamins B1 and B2, PP, pantothenic acid, vitamin B6, and provitamin A (carotene).

Vegetable soups, salads, side dishes are prepared from asparagus shoots, and as an independent dish they are consumed boiled with butter and breadcrumbs; shoots are also canned and frozen. Dishes prepared from asparagus are dietary and are recommended for diseases of the liver, kidneys, rheumatism and gout. There is evidence that asparagus lowers blood pressure, enhances the work of the heart, and relieves fatigue.

Asparagus is a herbaceous dioecious (sometimes monoecious) plant with a height of 1-1,5 m. Male plants are more powerful than female plants and produce a larger yield. The stems are round, erect, smooth, strongly branched. The leaves are small, scaly, underdeveloped, from their sinuses come out in bunches (3-6 each) filiform, green needle-shaped branches 1-3 cm long, which perform the function of leaves. Thick (cord-like) roots of adult plants, which serve to accumulate reserve nutrients, go deep into

the soil. Thin (filamentous) lateral roots extending from them are located in the arable layer, through them water and nutrients enter the plant from the soil. Mature plants have a powerful rhizome, from which young shoots develop in early spring. Each shoot develops new roots. The flowers are small, female - pale green, male - light orange. Cross pollination. The fruit is a 3-celled berry, initially green, turning red when ripe. Seeds are black, shiny, irregularly rounded, with a slight smell of vanilla. Germination is retained for 3-7 years.

Asparagus is propagated by sowing seeds, dividing adult rhizomes and cloning through tissue culture in vitro. Seeds germinate slowly even at +20...25°C, which is due to the presence of a dense shell. To speed up the germination process, the seeds are soaked for 3-4 days in water heated to +35...40°C, changing it daily, followed by drying at +25°C and frequent stirring of the heap. After 4-5 days, due to the thermal effect, the seeds germinate rapidly within 6-10 days.

Mature plants withstand frosts down to -30°C and overwinter well in the open field even in winters with little snow, however, young shoots during the regrowth period are sensitive to frost, the optimum temperature for their growth is 10-12°C. For seed germination, a temperature of 25-30°C is required, seedlings are very sensitive to cold and do not tolerate return spring frosts. The optimum temperature for the growing season of mature plants is 20-25°C. Asparagus is highly demanding on soil moisture: with a lack of moisture, the shoots are small, fibrous and bitter in taste. At the same time, it does not tolerate soils with a close occurrence of groundwater (with an excess of moisture, the roots die off). Soils suitable for asparagus are light, rich in organic matter, sandy or medium loamy, the optimal acidity is close to neutral or slightly alkaline. Light culture.

Conclusion and recommendation. Asparagus is grown by seedlings or by planting individual parts of the rhizome. Seedlings are grown in special open nurseries on highly productive soils; beds well fertilized with humus are used in garden plots. Sowing is carried out in late May - early June. 8-10 days before sowing, the seeds are soaked for 2 days in warm water (25°C), which is changed several times, then they are scattered on a damp burlap and placed in a warm place (25°C), making sure that they do not dry out. After 6-8 days, the seeds peck and they are sown on the beds. Sowing depth 2-4 cm, distance between rows 15-20 cm, distance between plants in a row 3-5 cm. After emergence, thinning is carried out, leaving 15-20 cm between plants. weeds, 2-3 row-spacing loosening, top dressing with full mineral fertilizer (10-15 g/m<sup>2</sup>), as well as slurry (1:6) or bird droppings (1:20), 1-2 times per season. The consumption of liquid fertilizers is 0,2-0,3 liters per 1 linear meter of the row. By the autumn of the 1st year of life, the seedlings have 2-3 stems. For better overwintering, seedlings are covered with a layer of peat or humus 3-5 cm thick. They are planted in a permanent place either in the spring of next year before the shoots started to grow, or in August. Sometimes the nursery is left for the 3rd year.

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