

Lecture

Leguminous plants - fruit and decorative

Legumes (lat. Fabaceae = Leguminosae = Papilionaceae) are a family of dicotyledonous plants, many of which have high nutritional value, and some are grown as ornamental plants.



Herbaceous representatives of this family are able to bind and retain atmospheric nitrogen in the soil. The family includes about twenty-four and a half thousand species of annual and perennial plants, united in more than 900 genera. The family is represented by three subfamilies - Caesalpinia, Mimosa and actually Beans. Representatives of subfamilies differ primarily in the structure of the flower.

Some leguminous plants have been eaten by man since the Stone Age, and the same leguminous product was treated differently in different countries. For example, in Greece, peas were the food of the poor, and in France, they were included in the exquisite menu of the king, in Ancient Egypt, lentil bread was an everyday dish, and in Ancient Rome, this plant was considered medicinal.

Leguminous crops are inferior only to cereal plants in terms of their distribution area. In countries with temperate, boreal, subtropical and tropical climates, leguminous plants make up a significant part of the flora. One of the indisputable advantages of legumes is the ability to adapt to a wide variety of natural conditions.

The leaves of legumes are alternate, usually complex - trifoliate, pinnate or bipinnate, with stipules, but there are also plants with simple leaves. Bisexual flowers are collected in axillary or terminal capitate, racemose, semi-umbrella or paniculate inflorescences. The upper large petal of leguminous plants is called a sail, the side petals are oars, and the fused or glued lower petals are called a shuttle. The legume fruit is usually a dry, often multi-seeded pod, or bean, with two flaps that open when ripe. Sometimes a ripe bean splits into single-seeded parts, but there are plants with a single-seeded bean that does not open on its own even when ripe. Legume seeds usually have large cotyledons without endosperm.

Fruit leguminous plants

Pea (lat. Pisum) is a genus of herbaceous plants of the Legume family. The pea is one of the oldest representatives of the family, introduced into culture about 8,000 years ago in the Fertile Crescent region, which included Mesopotamia, the Levant, prehistoric Syria and Palestine. From there, peas spread west to Europe and east to India. Peas were cultivated both in ancient Greece and in ancient Rome - mentions of

them were founding in the writings of Theophrastus, Columella and Pliny. During the middle Ages in Europe, peas became one of the main food resources of the poor, as they could be stored dry for a long time. They cooked peas with lard. Moreover, the first recipe for a green pea dish appeared in Guillaume Tyrel's book, written in the 13th century. It became fashionable to eat green peas in the time of Louis XIV, and the peak of popularity of this culture fell in France in the 19th century. In 1906, a work was published, which described more than two hundred varieties of peas, and in 1926, the Bonduel company was created, which organized the production of frozen green peas, which still holds the lead in the production of canned and frozen vegetables.

Peas appeared in America thanks to H. Columbus, who brought its seeds to Santo Domingo. It knows that American President Jefferson, who became famous for his love of agronomy, collected a collection of culture samples, which served as the basis for the development of precocious pea varieties. In 1920, the American inventor Clarence Birdseye proposed a method of freezing green peas, which was quickly mastering by Europeans, and in the state of Minnesota a pea monument was erecting - a giant green statue.



Field pea (Latin *Pisum sativum*) is a typical type of pea, a creeping annual, widely cultivated as a fodder and food plant. The pinnate leaves of the pea end in branchy tendrils, which the plant clings to the support. Peas have large stipules. Butterfly-like pea flowers are colored white, purple or pink. The seeds are slightly compressed spherical peas tightly packed in a pod.

Varieties of seed peas are dividing into three groups:

- shelled peas, whose spherical peas have a smooth surface. Second and first dishes are prepared from dry grains of husking varieties. They contain a lot of starch and are use both in the food industry and for the production of bioplastics;
- Brain pea is so call because its peas shrivel when ripe and look like a miniature brain.

The seeds of the brain varieties have a sweet taste and are often mistaken for sugar snap peas. Brain varieties are unseeing mainly for preparations - light varieties are usually preserved, and dark ones are frozen. Brain peas are unsuitable for cooking, as they do not boil;

- Sugar pea - these varieties do not have a parchment film in the pods. When drying, the seeds of sugar varieties are strongly distort due to the high moisture content.

Pea seeds are a source of carbohydrates and vegetable protein, but their main nutritional value lies in the high concentration of mineral salts and trace elements - each pea contains almost the entire Mendeleev table. In addition, the composition of the seeds

includes fatty acids, natural sugars, dietary fibers and starch. The seeds of the culture contain vitamins of group B, as well as vitamins A, H, K, E, PP.

Despite the cold resistance of the culture, it is growing only in sunny areas. Soils for peas need to be moist, but not wet, with a neutral reaction and light - mainly loamy or sandy. Peas grow best after pumpkin or nightshade crops.

In autumn, it is desirable to fertilize the pea plot with humus or compost at the rate of half a bucket per m² or to apply mineral fertilizers in the amount of 30-40 g of superphosphate and 20-30 g of potassium chloride per m², and in the spring, immediately before planting, it is necessary to fertilize the soil with ammonium nitrate at the rate of 20 -30 g per unit area. Early-ripening Hezbana, Tiresia, Alpha, Corvin, Zamira, Misti, early-ripening Glorioza, Vinko, Asana, Abador, mid-early Ashton and Sherwood, mid-ripening Viola, Matrona, Nicholas, Twin and late-ripening Resap are considered the best shelling pea varieties.

Among the sugar varieties, the super-early pea Meteor, as well as Beagle, Little Marvel, early-ripening varieties Medovyk, Children's Sugar, early-ripening Calvedon, Onvard, Ambrosia, medium-early Sugar Oregon, Alderman, medium-ripening Zhegalova 112, Oscar and late-ripening Nevychrypny 195 have proven themselves well.

Among the brain varieties, early-ripening Vera peas, mid-ripening Debut and late-ripening Belladonna 136 are popular.

Chickpeas Turkish peas, or mutton peas, or chickpeas, or nahat, or chickpeas (lat. *Cicer arietinum*) are a leguminous crop, especially popular in the Middle East. Chickpeas form the basis of many traditional Middle Eastern dishes, including falafel



and hummus, as chickpeas have been cultivated in the region for seven and a half thousand years. Chickpeas entered the territory of Rome and Greece in the Bronze Age, and several varieties of chickpeas were already known then. In Rome, it was believed that this pea stimulates menstruation, promotes sperm production and lactation, and has a diuretic effect.

At the beginning of the 9th century in Europe, chickpeas were already widely grown, and in the 17th century, it was considered more nutritious and less gas producing than seed or vegetable peas. Today, chickpeas grow in 30 countries of the world, but on an industrial scale, they are growing mainly in North Africa, Turkey, Pakistan, India, China and Mexico.

Chickpea is an herbaceous, self-pollinating annual with an erect, branching stem that reaches a height of 20 to 70 cm and is covered with ferruginous hair. Depending on the

variety, branching can begin at the base of the stem or in its middle part. The root system of chickpeas is rod-shaped, the main root reaches a length of one hundred and more centimeters, but the main mass of the roots lies at a depth of 20 cm. At the ends of the roots, tubers are forming, which contain nitrogen-fixing bacteria.

Chickpea leaves are also downy, complex, odd-pinnate, consisting of 11-17 obovate or elliptical segments. The color of the leaves can also be green, yellow-green, gray-green, and sometimes green with a purple tint, depending on the variety. During flowering, small white, blue, yellow-green, purple or pink five-membered flowers open on one- or two-flowered peduncles.

The chickpea fruit is an oval, oblong-oval or rhombic bean 1.5 to 3.5 cm long with a parchment inner layer. Seeds in the amount of one or two can be colored straw yellow, green or grayish-purple. There is such a pattern: varieties with white flowers give light seeds, and varieties with pink and purple - dark. Beans with seeds do not crack when ripening. Chickpeas can be angular; resembling a ram's head, or rounded or angular-round, resembling an owl's head. Small-grained, medium-grained and large-seeded varieties of chickpeas are distinguishing by size.



Chickpea sprouts contain high-quality fats and proteins, a lot of calcium, potassium, magnesium, vitamins A and C, essential acids tryptophan and methionine. Grains include protein, oil, carbohydrates, minerals and vitamins A, B1, B2, B3, B6, PP, A and C.

In agriculture, chickpea is an intermediate crop that replaces steam in arid conditions - it is used as a precursor for grain crops. Chickpea is the most frost-resistant, heat-resistant and drought-resistant leguminous crop. In addition, chickpeas do not need nitrogen fertilizers, as they are able to extract this element from the air and saturate the soil with it. Chickpeas do not require high quality soils, but they will not grow well in clogged or heavy clay soils. Choose well-lit areas with loose, drained soil for chickpeas. The well-proven chickpea varieties include the mid-ripening Yuvileyny, Radhospnny, Krasnokutskyi 195 and Budjak.

Edible, common, or cultivated lentil (lat. *Lens culinary*) is an herbaceous annual of the lentil family, one of the oldest crops, widely cultivated as a fodder and food plant. This plant has been known since ancient times: even in the Old Testament, it is mentioned that Esau traded his birthright for lentil soup. Lentils originated in Southeast Asia, but they are growing in all countries with a temperate and warm climate. In South America and Australia, lentils are the basis of many national dishes,

in India and China, they are considering the same national product as rice and in Germany, and they are using as a traditional Christmas dish.

The lentil root is thin, sparsely branched and hairy. The upright, branched stem reaches a height of 15 to 75 cm. The alternate, short-petioles paired-pinnate leaves end in tendrils. Stipules in lentils are entire, semi-lanceolate. Thick peduncles are crowning by an axis. Small white, pink or purple flowers, collected in racemes, open in June-July. The pendulous rhombic beans, about 1 cm long and up to 8 mm wide, contain 1 to 3 flattened seeds with an almost sharp edge. The color of the seeds depends on the variety.

Lentil fruits contain a large amount of iron and vegetable protein, easily absorbed by the human body, but the content of tryptophan and sulfur amino acids in lentils is not as high as in other legumes. Moreover, there is less fat in it than in sorghum. One serving of lentils contains 90% of the daily requirement of folic acid. Lentils also contain soluble fiber that improves digestion, potassium, calcium, iron and phosphorus, as well as manganese, copper, zinc, iodine, cobalt, molybdenum and boron, Omega-3 and Omega-6 fatty acids, vitamins C, A, PP and B groups, as well as is flavones that inhibit breast cancer.

However, loose, fertilized sandy and loamy soils of neutral reaction are more suitable for undemanding lentil growing conditions. It grows on heavy soils, and even on acidified ones, but it will not give a good harvest in such soil. Add sand to clay soil, and lime to acidic soil, and then you can sow lentils. The best predecessors for lentils are corn, potatoes or winter crops.

There are six varieties of lentils:

- Brown intended mainly for soups. It is quickly prepared, especially after pre-soaking, and has a nutty aroma;
- Green is an unripe brown lentil, which is added to salads, meat and rice dishes;
- Yellow - unripe brown lentils without skin;
- red lentils are lentil grains without shells, so the process of making puree or soup from them takes only 10-12 minutes;
- Black lentil, or beluga lentil – a very small lentil, similar to beluga roe, retains both color and shape after cooking;
- French green lentils, bred in the town of Pay, which are considered the most delicious and refined. It has a mild aroma, an original marble pattern and a soft skin. French lentils retain their shape during cooking, so they are used to prepare soups, salads, casseroles, and are served as a side dish to fish and meat.



Bean

Bean (lat. *Phaseolus*) is a genus of the Legume family, which includes almost a hundred species that grow in warm and temperate climates. The most popular species of the genus is common bean (*Phaseolus vulgaris*), which is native to Latin America. Varieties of common beans differ in

the variety of shapes and colors of leaves, flowers and fruits. Both seeds and bean pods of this oldest plant, which was cultivated in America by the Aztecs, are using for food. After the second voyage of Columbus, the bean came to Europe, where it was first grown as an ornamental plant, and only from the end of the 17th century, it was cultivated as a vegetable crop.

The height of the bean can reach from 50 cm to 3 m. Its strongly branched and hairy stem can be straight or curly. Leaves in beans are trifoliate, paired-pinnate and long-stalked. Butterfly flowers of white, purple and dark purple color, located on long peduncles of 2-6 pieces, collected in the axils of clusters. Bean fruits are curved or straight, almost cylindrical or flattened hanging beans 5 to 20 cm long and 1-1.5 cm wide. The color of the pod varies from pale yellow to dark purple. The beans have two to eight elliptical seeds that are white or dark purple in color, plain or speckled, spotted or musical.

Bean seeds contain proteins, carbohydrates, fatty oil, carotene, phosphorus, potassium, zinc, copper, essential amino acids, flavonoids, sterols, organic acids (malonic, citric and malic), as well as vitamins - ascorbic and pantothenic acids, thiamin and pyridoxine. Raw beans, especially those with red seeds, contain lectins that must be neutralizing by boiling for 30 minutes. Bean proteins are similar in composition to meat proteins. Soups, side dishes and preserves are made from beans. In some cases, beans are a dietary product. Bean pods are used to prepare an extract that lowers blood sugar and increases diuresis. In folk medicine, rheumatism, hypertension, and salt metabolism disorders are treated with bean leaf infusions.

Beans are growing in well-drained soil fertilized with compost or humus. By composition, it can be loam or sandy loam. It is better to place the site on a south or southwest slope protected from the wind.

Varieties of beans are divided into three groups:

- with husk or grain beans - these varieties differ in the presence of an internal dense parchment layer, so they are usually grown for grain;
- With semi-sweet beans - in these varieties, the parchment layer is not so dense or appears already at a late stage of grain development;
- With sugar beans or asparagus beans - these are the most valuable and tastiest varieties, since there is no parchment layer in their pods.

Early ripening beans are represented by the following varieties: Ploska longa, Prysadibna, Saxa 615, Caramel, Shahin, Golden nectar, White seed 361. Among the mid-ripening varieties, the most popular are Motolska Bila, Pation, Moskovska Bila, Yuvileyna 287, Fire Red, Peremozhets, Violetova, and from late beans, the Blue Gilda, Koroleva Nekar and Vrodlyvy Yas varieties are most often preferred. If you decide to grow asparagus beans, then the best varieties of this variety are Indiana, Berghold, Deer King, and Gina asparagus, Panthera, Olga, Paloma Skuba and Pencil Pod.

Of the varieties of curly beans, Violetta, Herda, Turkenia, Golden Neck, Moorish, Lambada, Fatima, Peremozhets and Purple Queen are more often cultivated, and of the bush varieties, the most famous are Oil King, Caramel, Indiana and Royal Purple Pod.

Cultivated soybean (lat. *Glycine max*) is an annual herbaceous plant, a species of the Soya genus of the Legume family. Cultivated soy is growing in Southern Europe, Asia, South and North America, South and Central Africa, Australia and the islands of the Pacific Ocean. Soy, like other legumes, is one of the oldest cultivated plants - the history of its cultivation goes back at least five thousand years: a mention of soy was founding in Chinese literature dating back to the third or fourth millennium BC. However, there is also an opinion that soy as a cultivated plant was forming even earlier - 6-7 thousand years ago. Soy was introducing into the culture in China, and then it spread to Korea and Japan. The plant came to Europe in 1740 through France, and in 1790 soybeans were brought to England, although the crop was widely cultivated in Europe only in 1885. In 1898, many varieties of soybeans from Asia and Europe were brought to the United States, and at the beginning of the thirties of the last century, this crop was grown in America on an area of 1 million hectares. In the Russian Empire, the first sowing of soybeans was caring out in 1877 on the territory of modern Ukraine - in Tavria and Kherson provinces.

Currently, genetically modified soy is included in many products. The world leader in the production of GM soybeans is the American company Monsanto. The following characteristics have earned the popularity of edible soybeans:

- High yield;
- High protein content; excellent results in the prevention of cardiovascular diseases and osteoporosis;
- the presence of the most valuable substances in the composition of plant grains - vitamins E, PP, A, group B, calcium, potassium, magnesium, sulfur, chlorine, sodium, iron, manganese, copper, aluminum, molybdenum, nickel, cobalt, iodine, linoleic and linoleic acids;
- Unique properties that allow the production of useful products from soybeans - soybean oil, milk, flour, meat, pasta, tofu, sauce, and others.

In addition to the fact that soy is unseeing as a useful and inexpensive substitute for meat and milk, it is part of fodder for young farm animals.



The root system of soybeans is rod-shaped, the main root is thick, but not very long, and the lateral roots can reach two meters underground. The stems of soybeans are thin or thick, erect, slender or curly, well branched, from 15 cm to 2 m or more in height. Lateral shoots depart from the stem at different angles, forming a sprawling,

semi-spreading or compact bush. Both stems and shoots of soybeans are covering with yellow, white or brown hair. When ripening, the soybean stalk becomes brownish-yellow or red. Soy leaves are alternate (except for the first two opposite ones), usually trifoliate, with small stipules. The shape of the leaves, depending on the variety, can be rhombic, broadly ovate, oval, and wedge-shaped with blunt or pointed tops. In most varieties, when the fruits ripen, the leaves fall off, which greatly facilitates harvesting.

Small white or purple soybean flowers are collecting in the axils of the inflorescence - sometimes short and few-flowered, and sometimes long multi-flowered. Soybean fruits are straight, sword-shaped, slightly bent or sickle-shaped beans, convex or flat, light, brown or brown, with reddish pubescence, 3 to 7 long and 0.5 to 1.5 cm wide. In beans from one to 4 grains - oval, round, oval-elongated, flat, convex, large, medium or small, green, yellow, brown, black, with a scar of gray, light or dark brown color.

Soybeans are drought tolerant, but if you want to get a good harvest, the soil in which it grows must be well draining. It is better to grow soybeans in areas with fertile loamy or sandy soil, located in the open sun, but protected from the wind. There are six varieties of cultivated soybeans:

- Semi-cultural;
- Indian;
- Chinese;
- Korean;
- Manchurian;
- Slavic.

Based on these subspecies, soybean selection was carried out, which resulted in many varieties and hybrids. On the territory of the former CIS, Manchurian and Slavic subspecies varieties and their hybrids are common. The most popular varieties in the south of Russia and Ukraine can be considered Amethyst, Altair, Ivanka, Vityaz 50, Bystrytsia 2, Kyivska 98, Chernivtsi 8, Romantika, Terezinska 2, Deimos, Poliska 201, Ros, Veras, Yaselda, Volma, Pripyat and Oressa In the conditions of the middle zone,

the varieties Svitla, Lastivka, Okska, Lazurna, Harmony, Sonata, Lydia, Yanka, Aktai, Mlist 1, Mageva and others are more often grown.

Cultivated peanut or underground peanut, or groundnut (lat. *Arachis hypogaea*) is an important agricultural plant grown on an industrial scale. Actually, it is wrong to call peanut a nut, in fact it is a legume originally from South America. Peanuts well knew to the aborigines of Peru even before the Conquista. The Spanish brought peanuts to Europe and the Philippines, and the Portuguese brought them to India and Macau, as well as to Africa, from where they were brought to North America together with black slaves.

At first, peanuts were feeding to pigs in the States, but during the Civil War, soldiers of both armies ate them. At that time, peanuts were the food of the poor, but they were not widely grown as a food crop, and only in 1903, agro chemist George Washington Carver, studying peanuts, invented more than 300 products from it, including cosmetics, beverages, dyes, medicines, soaps, insect repellent and even printing ink. The scientist convinced farmers to alternate growing cotton and peanuts on the same field, and since then this crop has become one of the main crops in the southern states of America. On the territory of the former USSR, peanuts are growing in Central Asia, somewhere in Transcaucasia and Ukraine, as well as in the southern regions of Russia.

Cultivated peanut is an annual plant from 25 to 70 cm tall with a rod branched root system, erect, indistinctly faceted, pubescent or bare stems, prostrate or upward branches, branchy shoots, regular pubescent pinnate leaves from 3 to 11 cm long.

The petioles of the leaves are groove, and the leaves themselves consist of two pairs of pointed elliptical leaflets and large, elongated, entire-edged and pointed stipules fused with them. Whitish or yellow-red peanut flowers, collected in 4-7 pieces in small-flowered clusters, bloom in early June or early July. The fruits are indecipherable oval and swollen beans from 1.5 to 6 cm long with a spider web pattern on the porous skin, which, when ripening, bend to the ground, burrow into it and ripen there. Each bean contains 1 to 5 oblong beans about the size of a bean, covered with a dark red, grayish-yellow, cream, or light pink skin. The fruits ripen in September-October.



Peanut seeds are saturating with fatty oil, which includes glycerides of stearic, palmitic, oleic, linoleic, lauric, behenic and other acids. In addition to oil, grains contain proteins, globulins, glutens, starch, sugars, amino acids, vitamins E and group B, magnesium, potassium, calcium, phosphorus and iron. Peanuts are using in the food

industry for the preparation of confectionery and other dishes, as well as the famous

peanut oil. The medicinal properties of peanuts, which are a strong antioxidant, are also well known.

Peanuts are growing on light loams, loams and sands. The site should be sunny and protected from the wind. There are four varieties of peanuts:

- Runner - high-yielding varieties that are grown mainly for processing into oil, for example, Dixie Runner, Early Runner, Bradford Runner, Egyptian Giant, Georgia Green, Rhodesian Spanish Bunch and others;
- Virginia - varieties with the largest grains, from which salty and sweet nuts are producing. They include the North Carolina group of varieties (7, 9, 10C, 12C V11), the Virginia group of varieties (C92, 98R, 93B), as well as the Wilson, Perry, Gregory, Gull, Shulamit and other varieties;
- Spanish (Spanish) - varieties with small grains covered with a red-brown skin. These nuts are good in chocolate or sugar glaze, they contain a lot of oil and are using as a raw material. Varieties of this variety include Dixie Spanish, Argentine, Spanet, Spantex, Shafers Spanish, Star, Comet, Florispan, Spancross, O'Lin, Spanky and others;



- Valencia – sweet nuts of this type are covering with a bright red skin. They are most often solving fried. This variety includes Tennessee White and Tennessee Red.

Fodder legumes

Sowing vetch or pea (Latin *Vicia*) is a genus of flowering plants of the Legume family, representatives of which grow in moist forests, steppes and shrubs, floodplain meadows, forest glades in areas with a temperate climate. Humanity grows some types of vetch for decorative purposes, but mostly plants of this genus are using for fodder or as a sider.

The genus is represented by both annual and perennial plants with a creeping or erect stem, pinnate leaves ending in tendrils or straight bristles, and almost sessile flowers, single or collected in axils of 2-3 pieces. The fruits of vetch are cylindrical flattened multi-seeded or two-seeded beans. The vetch is a beautiful honey plant. Cattle willingly eat vet, and it has a good effect on the quality of milk, however, in overripe form, the plant can cause miscarriage in cows. Vet hay is an excellent feed for adult livestock, but it is harmful to nursing mares, calves, foals and lambs. Vet straw is nutritious, but difficult to digest, so it is adding to other feed in small portions.

Boiled vetch chaff is excellent fodder for pigs.

For green manure, vetch is growing as an intermediate crop, and as a siderite, it is of interest as a precursor for seedlings of pepper, tomatoes and other garden plants. Sow

vetch on cultured and moistened nutrient soils with weak acid reaction. Swampy, acidic, saline and dry sandy soils are not suitable for its cultivation. The most famous varieties of vetch are Mykilska, Lyudmila, Barnaulka, Lhovska 22 and Vera.



Clover (lat. *Trifolium*) is a genus of plants of the Legume family. The best-known species of this genus in culture is red or meadow clover (lat. *Trifolium pratense*), which grows naturally in Europe, North Africa, Central and Western Asia.

Meadow clover is sometimes a biennial, but more often a perennial herbaceous plant, reaching a height of 15 to 55 cm. Its stems are branched, stretch upwards, the leaves are three-lobed, with fine-toothed, broadly ovate lobes of whole leaves with eyelashes on the edges. Globular inflorescences of red or white clover are often placed in pairs and are usually covered by the upper leaves. Clover fruit is an egg-shaped one-seeded legume. The seeds are round or angular, yellow-red or purple. Clover blooms in June-September, and its fruits ripen in August-October.

Vitamin concentrates are obtained from clover leaves, and the essential oil of the plant is used for aromatic baths and the production of homeopathic preparations. Meadow clover is one of the most valuable crops that is used as green fodder and is used to make silage and hay. Clover straw is also fed to cattle. In folk medicine, infusion and decoction of clover was used as a remedy for appetite, in the treatment of tuberculosis, cough, whooping cough, bronchial asthma, migraine, malaria, uterine bleeding and painful menstruation. Eyes inflamed from allergies were washed with fresh clover juice, and purulent ulcers and wounds were treated with a compress made of crushed leaves.

In culture, clover is as unpretentious as it is in nature, but it is better to sow it in the sun in weakly acidic or neutral soil, where cereal crops used to grow. Before sowing, it is necessary to deeply plow the plot and remove weeds from it. If you are interested in the decorative qualities of the plant, it is better to sow some type of creeping clover (*Trifolium repens*), for example, Atropurpurea, Good Luck, Purpurascens, Swedish pink hybrid clover (*Trifolium hybridum*) or red clover (*Trifolium rubens*).

Alfalfa seed (lat. *Medicago sativa*) is a herbaceous plant, a typical species of the alfalfa genus. In its wild form, it grows in the Balkans and in Asia Minor in the steppes, river valleys, on dry meadows and grassy slopes, on the edges of forests, shrubs and ditches, and in culture, it is growing all over the world as a fodder plant. Alfalfa stems are hairy or bare, four-sided, strongly branched in the upper part and reach a height of

80 cm. They can be straight or lying. The rhizome of the plant is thick, powerful, and lies deep. The leaves are petiolate, whole, and elongated-ovate, with leaflets 1-2 long and 0.3-1 cm wide. On long axillary peduncles, a dense multi-flowered cluster 2-3 cm long is forming, consisting of blue-purple flowers. Alfalfa fruit is a bean with a diameter of up to 5 mm.



Alfalfa, like clover and vetch, is a honey-maker - immediately after pumping, the golden-yellow alfalfa honey thickens to the state of homemade cream. Alfalfa is a valuable crop that is growing not only for fodder, but also for green manure, as well as siderite for cotton, grain and vegetable crops. Some varieties of the plant are unseeing for

food, adding to salads. As a fodder plant, alfalfa has been cultivated for six or seven thousand years: from its natural range, it spread around the world with the armies of conquerors. For example, the Persians brought alfalfa to Greece, the Saracens to Spain, and the Spanish to South America and Mexico, and from there the plant got to Texas and California. Now alfalfa is growing all over the world.

Alfalfa grows on well-drained, highly fertile medium-loamy soils with a slightly acidic or neutral reaction. It should not be sown on acidic, swampy, saline, clay or stony soils or where groundwater is high. When growing on poor soils, it is necessary to apply fertilizers, and saline soils require flushing irrigation. There are about 50 varieties of alfalfa for sowing, but the varieties Laska, Rosinka, Lyuba, Northern hybrid, Bride of the North, Marusynska 425, Bibinur, Fraver, Madalina, Kamila and others are usually grown.

In addition to alfalfa, vetch and clover, leguminous fodder plants are sometimes grown as fodder, such as safflower, safflower, fodder beans, anhullis and seradella, but these crops are less popular.

Decorative leguminous plants

Lupine (lat. *Lupinus*) is a genus of plants of the Legume family. They are a genus of annual and perennial herbaceous plants, as well as subshrubs and shrubs. The name of the plant is translated as "wolf", and lupins are often called "wolf beans". In the wild, lupine can be found in the Mediterranean, Africa, and in the Western Hemisphere it grows in the territory from Patagonia to the Yukon and from the Atlantic to the Pacific Ocean. There are no more than 200 plant species in total, but white lupine was the first to be cultivated about 4,000 years ago - it was used as fodder, fertilizer and medicinal

plant in ancient Greece, Egypt and Rome. In addition, variable lupine has been grown in culture since the time of the Incas.



Interest in lupine is caused by the high content of protein and oil in its seeds, close to olive oil. Since ancient times, lupine seeds and its green mass have been used as fodder for livestock. The plant is also grown as a siderate. You can also use lupine as a green fertilizer - it allows you to keep the plot of land clean and, by growing environmentally friendly vegetables and cereals, save on expensive fertilizers. Lupine is also in demand in

pharmacology and medicine. But this culture is grown as a decorative flowering plant in summer cottages.

Lupine's root system is rod-like, reaching a depth of 1-2 m. Bacterial tubers are located on the roots, which absorb nitrogen from the air and bind it. Herbaceous or woody stems of lupine, leafy to varying degrees depending on the species, reach a height of one and a half meters. Branches are erect, slender or recumbent. Finger-fold alternate leaves are connected to the stem by long petioles. The alternate, semi-ring or ring-arranged flowers form a multi-flowered apical cluster up to 1 m long. In zygomorphic lupine flowers, the sail is oval or rounded, straightened in the middle. The color of the flowers can be cream, yellow, pink, red, purple and various shades of purple.

Fruits are leathery, slightly bent or linear beans with an uneven surface of cream, brown or black color. The seeds of different types and varieties of lupine differ in size, shape and color. Their surface is fine-grained or smooth.

Lupine is highly drought-resistant and prefers a temperate climate, although some species tolerate even very low temperatures. This leguminous plant is sown in sandy or loamy soils with a neutral, weakly alkaline or weakly acidic reaction. The following types of lupine are grown in culture:

- blue (narrow-leaved) - Nadiya, Vityaz, Snizhet, Crystal, Rainbow, Zmina varieties;
- yellow - varieties Nadiyniy, Narochanskyi, Prestige, Zhytomyrskyi, Shvidkorosrosyskyi, Akademichnyi 1, Demidivskyi, Fasel;
- white - varieties Gamma, Dega, Desnyanskyi;
- multi-leaved (belongs to perennials) - varieties Albus (white), Burg Frühlen (sparkly white), Schloss Frau (pale pink), Abendglut (dark red), Castellian (blue-purple), Carmineus (red), Apricot (orange), Edelknabe (carmine), Roseus (pink), Kronleuchter (bright yellow), Rubinkenig (ruby purple), Princess Juliana (white-pink).

Shy mimosa (lat. *Mimosa pudica*) is a herbaceous perennial from the genus *Mimosa*, which includes about 600 species. *Mimosa* comes from the tropical regions of South

America, but as an ornamental plant it is grown all over the world, in particular in indoor culture.

The height of mimosa reaches 30-70 cm, but sometimes it can grow up to one and a half meters. The stem of the plant is prickly, the leaves are up to 30 cm long, bipinnate, hypersensitive: in the sunset, in cloudy weather or from touch, it folds and falls. On



long flower stalks, small purple spherical inflorescences with a diameter of up to 2 cm are formed. The fruit of mimosa - a hooked curved bean with 2-8 seeds - opens when ripe.

Those who decide to grow shy mimosa in an apartment should know that due to its toxicity, the plant should be kept away from children and pets. In addition,

mimosa does not tolerate tobacco smoke and immediately drops its leaves in protest.

Silver acacia, or whitewashed (lat. *Acacia dealbata*) is a species of tree of the genus *Acacia* of the leguminous family native to the southeastern coast of Australia and the island of Tasmania. This species grows in southern Europe, South Africa, Madagascar, the Azores and the western United States. In everyday life, silver acacia is usually called mimosa, although these crops belong to different genera. Silver acacia is a fast-growing tree with a spreading crown that grows up to 10-12 m, and its trunk can reach a diameter of 60-70 cm. The bark of the plant is gray-brown or brown, fissured, gum often protrudes from the cracks. The young branches of the plant are olive-green with a bluish coating, as well as the leaves, which is why this acacia got its species name. Twice pinnate alternate leaves 10-20 cm long consist of 8-24 pairs of small elongated leaflets of the first order.

Each leaf has up to 50 pairs of elongated leaflets of the second order, the width of



which does not exceed 1 cm. 20-30 fragrant, very small bluish-yellow flowers are collected in heads with a diameter of 4 to 8 mm, which form inflorescences, which in turn make up panicles. Fruits of silver acacia are elongated-lanceolate, oblong, flat beans of light brown or purple-brown color, from 1.5 to 8 cm long and up to 1 cm wide.

Very hard black or dark brown seeds of an elliptical shape, 3 cm long, are located in

separate nests of the pods. -4 mm. The tree blooms from the end of January to the middle of April, and bears fruit in late summer or early autumn. Silver acacia is a beautiful honey bear.

Acacia gum contains tannins, flowers contain oil, the composition of which includes hydrocarbons, aldehydes, acid esters, acids and alcohol with the smell of ambergris, and flavonoids are found in the pollen.

Silver acacia is grown only in warm climates, as it cannot withstand frost below 10 degrees. It should be planted in the sun, protected from gusts of wind, in fertile soil of neutral reaction. Acacia is drought-resistant, but needs constant watering at first after planting.

Properties of leguminous plants

All leguminous plants have bisymmetric irregular flowers, collected in axillary or apical heads or clusters. The most characteristic flower shape is butterfly, although some believe that leguminous flowers look more like a boat with a sail.



The roots of many legumes have a characteristic feature: growths are formed on it, in which colonies of nitrogen-fixing bacteria live, which absorb this element from the air and convert it into a form more accessible to plants. This nitrogen serves as nutrition for the plant itself, accumulating in all its organs, and is released into the soil. That

is why legumes are grown as green manure and used as siderates. It is difficult to overestimate the nutritional qualities of leguminous seeds, because due to the protein contained in them, they are an inexpensive substitute for meat, which is especially important for vegetarians. In addition to protein, legumes contain vitamins and fiber, as well as other substances that are very valuable for the human body. Another advantage of legumes is that they do not accumulate nitrates and toxins, which is why legume feed is so highly valued.

A number of leguminous plants are medicinal, for example, cashews, Japanese sophora, licorice gola and Ural.

Leguminous plants - growing features

All leguminous crops are grown by sowing seeds in open ground, and the seedling method is used only for heat-loving plants, such as peanuts and beans. Pre-soaking the seed material accelerates the emergence of seedlings, but the seeds should not be in water for longer than 12 hours, otherwise they may not germinate. Almost all

representatives of the Bean family prefer sandy or loamy soils of neutral reaction, but a slight shift in the acidic or alkaline direction is possible.

A significant part of legumes is in symbiosis with nodule bacteria that supply the soil with nitrogen. But the ability to assimilate nitrogen from the air appears in plants only after flowering, therefore, at the very beginning of growth, it is necessary to apply complete mineral fertilizer to the soil, which includes the nitrogen component. It is desirable to sow legumes after crops under which organic matter was applied, and in order for tubers with bacteria to form on the roots of plants, it is necessary to use special bacterial fertilizers.

Caring for legumes is simple: weeding, watering, loosening, loosening and protection against diseases and pests.

Different types of legumes have their own characteristics. First of all, this concerns the timing of sowing. Cold-resistant and early-ripening species (peas, beans) manage to produce a crop in any climate, and only early-ripening ones (for example, some types of beans) ripen from heat-loving crops in the middle zone. To grow medium-ripe plants, you have to resort to the seedling method. But there are crops that can be grown only in warm regions (chickpeas, cowpeas). Most legumes are moisture-loving and require regular soil moisture (peas and soybeans), but there are plants that grow well in arid climates, such as chickpeas and beans.