

SOME BIOECOLOGICAL CHARACTERISTICS OF SOYBEAN VARIETIES

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In world agriculture, soybean is the most cultivated plant among legumes and oilseeds. The United States, Brazil, Argentina, China, and India are the most important countries, accounting for 90% of the world's soybean acreage. In recent years, great attention has been paid to soybean cultivation in Canada, Italy, France, Bolivia and Russia. Over the next 20 years, soybean production increased 2.16 times (130 million tons per year), the cultivated area increased 1.6 times, and the yield increased 1.35 times [1,2].

The reason why soybeans are grown in large areas in different countries is that their grain and green mass are nutritious, and soybeans can be used in food, fodder, and technical and medical fields. Depending on the type of soybean and growing conditions, its grain contains 30-48% protein and 17-26% fat. Soybeans contain 20-25% carbohydrates, 4-5% ash elements (including calcium, phosphorus, potassium, sodium, iodine, molybdenum, etc.), vitamins (E, V1, V2, V6, pantothenic acid, choline, folate, biotin and b.) occurs. More than a thousand products are obtained from soy. Soybean is one of the main crops in the production of food protein, oil, compound feed, and fodder.

Obtaining a high and quality harvest from soybeans requires solving complex problems. The main of these is the development of regional agrotechnics of soybean cultivation and the selection of soybean varieties suitable for certain soil and climatic conditions. This, in turn, requires determining the bioecological characteristics of soybean varieties and taking into account the soil-climatic characteristics of a particular region.

Lack of familiarity with the biological properties of soybean varieties leads to incorrect selection of planting dates and agrotechnical measures, ultimately leading to a sharp decrease in plant productivity.

The soybean (*Glycine hispida* L.) is an annual plant belonging to the soybean family (Glicine) of the legume family (Fabaceae). The homeland of soybean is Southeast Asia, and there is information that it was planted in China 6,000 years ago. Currently, there are more than 2500 varieties [3,4].

Soybeans are short or tall, depending on the variety, the soil and the climate in which it is grown. Soy is mainly an upright-growing plant, and its lying and creeping forms are also found [5-11].

Just as the height of the soybean plant (30-200 cm) varies, so does the thickness of the stem. In some varieties, the thickness of the stem is 3-5 mm, in others, it is 9-11 mm, in some varieties, it is even 20-22 mm. Thin-stemmed soybean varieties tend to grow prostrate.

The hypocotyls of newly grown soybean seedlings are green or purple in colour. Most of the time, if the stem has a strong (dark) green colour, the flowers of the shade are white, and if the stem has a light purple colour, the flowers are purple. The stems of most soybean varieties are

covered with light brown hairs. If the hair on the stem is sparse, it is more resistant to diseases and pests. Feathers mainly serve as protection for the plant.

Side branches on the main stem are formed differently - in the range of 3-15 cm. Usually, the location of the first and second side branches depends on the genotype of the plant and the growing conditions. The first set of lateral branches produces many pods, but most of them are shed before the pods at the top of the stem mature. Depending on the location of the lateral branches, the hairs of the soybean stem are also scattered, semi-scattered, and uncollected. The pods are also dense or scattered depending on the location of the side branches [12-17]. In some cultivars of soybeans, the stem stops growing after the topmost spike flowers form pods; and in some varieties, the pods grow until they begin to ripen. Soybean plants have complete, intermediate and incomplete forms depending on the growth character of the stems. In the unfinished stem, the leaves are located at the top, and the pods are located below the leaves. Along with the pods, small leaves are formed on the intermediate stem. On the finished stem, large leaves are located at the same height as the pods. When the pods begin to ripen, the stem of the plant turns yellow, light brown or mauve.

The thickness, length, and number of interstices of the soybean plant vary. It varies depending on the genotype of the plant (variety) and natural-climatic conditions (temperature, light, humidity and soil fertility, amount of nutrients, planting period, etc.) under which soybean is grown.

Soybean is a plant with a well-developed root system, the arrowroot of which penetrates the soil to a depth of 1-1.5 meters. The root of the plant develops mainly in the arable layer of the soil, forming a large number of lateral roots. 8-12 days after the germination of soybean seeds, the first buds begin to appear on the main root. The number and size of the tubers depend on the genotype of the plants, the microflora in the soil and its fertility, and nitrogenization before planting soybean seeds. Tuganak bacteria absorb molecular nitrogen from the air, provide the nitrogen needs of the plant and enrich the soil with nitrogenous compounds [18-21].

The leaves of the soybean plant are complex, with three leaflets per leaf band, which alternate on the stem. The shape of the leaves is different - lanceolate, heart-shaped, oval and round. The shape and size of leaves depend on factors such as temperature, light, humidity and nutrition. The length of the leaf is 5-10 cm, and the width is 3-10 cm, depending on the type of shade and growing conditions. The length of the leaf band varies in different varieties: 9-25 cm and the thickness reaches 0.2-0.6 cm. One plant can have 20-40 or more leaves. Whether the leaf surface is flat, thick or thin, soft or hard depends mainly on the genotype of the plant. Another characteristic feature of soybean leaves is that as the pods ripen, they turn yellow in colour and fall naturally one after the other [22-24]. The flowers of soybean are very small and are placed in the axils of the leaves. The ball flower of the soya has a shingle appearance. The number of flowers in the leaf axil is 20-24, and the size of each flower is 5-6 mm. There are 5 sepals, two of which grow fused, and the lower three develop separately and are longer than the fused sepals.

The holly leaves are white or purple in colour, the top holly leaf is called a sail, the holly leaf on both sides is called a wing, and the two lower leaves are called a boat. Sail marigolds are darker in colour and larger in size than wing and boat marigolds. The leaves of the boat grow together and are slightly folded in the middle. There are 10 male pollinators, of which 9 are

combined and one grew separately. The stamens are 3-4 cells, they split lengthwise. The pollen is sticky, and yellow in colour, and the seeds are elongated.

The flowers of soybean are small, invisible and cannot attract insects. Soybean flowers are self-pollinating, pollinating first and then opening. The flowering of plants begins with the formation of 6-10 leaves. Soybean is a self-pollinating plant. The flowering period of the plant is long in soybean varieties, it lasts up to 17-30 days in early-ripening soybean varieties, and 60-80 days in late-ripening varieties.

Soybean pods have different shapes: straight, bent, sickle-shaped, bulbous, 3-7 cm long and 0.5-1.5 cm wide. Seeds are placed in pods 1-4, often 2-3. The number of pods can be from 10 to 200-350 per plant. The number of pods depends primarily on their genotype and natural conditions. Soybean pods are light yellow, greyish yellow, light brown, dark grey and dark brown when ripe. The height of the lower pods on the plant stem also varies depending on the characteristics of the soybean variety and climatic conditions. The number of pods is from 1-3 to 8-12 in the leaf axil.

The colour of soybean (seeds) is yellow, light green, light brown and black. The size of the seeds is also variable, the average weight of 1000 seeds is from 80 to 250 g. Soybean seeds are round, oval, oblong, and blistered. Soybean consists of the seed coat, seed coat and bran. FAO according to the recommendation, the quantitative description of the phases of growth and development of plants is given with a 10-point scale. The emergence of a plant from the soil above the ground is considered to be zero, and a physiologically mature plant is considered to be 10.

The growth process of the soybean plant is divided into the following stages: the appearance of cotyledon leaves (0), the formation of the first trifoliolate leaves (1), the formation of 4 trifoliolate leaves (2), the beginning of flowering (3), gross flowering (4), formation of the first pods (6), formation and ripening of pods (7-10). The size of the adult plant depends on the genotype and environmental factors.

Soybean seed consists of three parts: seed coat, pod and seed coat. The seed makes up the bulk of the soybean seed and provides the plant with nutrients for almost two weeks.

Soybean germination begins with seed germination: the seed absorbs water up to 50% of its weight. Excess moisture reduces germination (affects seed respiration).

The minimum temperature for soybean seed germination should be around 6-8 °C. In-room conditions, when the optimum temperature is 20-24 °C, the seeds germinate 90-100% in 2-3 days. When the necessary conditions for seed germination in the soil are sufficient, grasses will be visible for 5-7 days. Fertilization in field conditions is high, reaching 70-80%.

The analysis of the above-mentioned literary sources indicates the lack of research conducted in our republic on the influence of planting standards on the growth and development of soybean plants. Therefore, taking into account that the amount of saline soils is increasing in the republic, it is important to determine the biology of the development of different soybean varieties in moderately saline soils and to select suitable soybean varieties in terms of chemical composition for the processing industry in our republic.

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