SOYBEAN RESISTANCE TO DROUGHT AND OTHER STRESS FACTORS

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Abstract: The growth and development of soybean and the quality and composition of the crop are highly influenced by external environmental factors. Each influencing factor differs from one another according to its characteristics. It should be said that the soybean plant does not choose a place according to its biological characteristics. It also grows in saline, cultivated fields with elevated groundwater levels. It is also very convenient to care for it in a mixed way.

Key words: *genotypic, mesophyte, critical phase, nodule, ripening phase, photosynthesis, transpiration.*

Depending on the conditions of origin of the soybean plant, with genotypic resistance to drought and high humidity, cold and high temperatures, infertile and high levels of mineral fertilizers, dense and porous soils, as well as salty and sour. resistant to soils, but when these factors are optimized, it grows well, develops and gives high yields.

Drought resistance . Among legumes, soybean is second only to pea in terms of drought tolerance. Drought resistance is related to the centers of origin, Korean and Indian subspecies are less drought resistant than Manchurian and Chinese species. In the first half of the shadow period, the above-ground part grows slowly, and during the period of active growth of the root system, it is resistant to drought (until the flowering period). Water requirements are very demanding during the flowering, podding and seeding periods. When there is insufficient moisture, existing pods are shed and new pods are formed. The optimal moisture content of the soil should be 26-36%. Physiologically, soybean belongs to the group of mesophytes, easily overcomes air and soil drought. Soybean water requirements vary by developmental stage. It requires a lot of water for seed germination and grass germination. The highest water consumption of the plant is

observed during flowering and seed filling. During this period, the fastest growth of the stem, the highest average daily growth of the leaf area and the rapid formation of pods are observed. If there is a lack of water during this period, the buds, flowers and nodes of the plant will die. Drought during flowering can reduce seed yield by 50% or more. According to the results of many years of breeding, soybean varieties are well adapted to drought conditions, and in drought conditions, it is possible to get a reliable harvest of 0.5-0.9 t/ha in early varieties and 1.0-1.4 t/ha late ripening varieties were harvested. Soybean has biological adaptation properties to drought conditions: reduction of transpiration, closing of stomata, hairiness. It requires a lot of water for seed germination and grass germination. In drought-resistant species, in conditions of low soil moisture, the amount of water retained in their cells increases, cell sap and osmotic pressure, the maximum temperature of protein coagulation is high, and they differ in the characteristic of high synthesis. flowers, pods and seeds are shed. The shedding of vegetative organs increases resistance to drought, protects against water shortages, shadow formation has been observed under the influence of drought. The flowering period is much longer. The number of pods compared to the number of formed flowers was 43-66% according to the varieties. Among the varieties, the number of woven pods was 46-49% compared to the number of formed pods. The number of ripened seeds per plant varied from 68 (Volna variety) to 115 (Rannyaya-10 variety), their weight was 9.5-14.6 grams. (VF Baranov, VMLukomes, 2005). From flowering to pod formation, water consumption increases, the temperature is high. Water consumption is high in the phases of podding and filling, but the increase in filling with organic matter decreases. Drought in the flowering phase reduced the yield by 48-58%, drought in the flowering period drops the pods and flowers (87-92%), the seed weight decreases. A moderately developed soybean plant consumes 100-150 g of water per day from germination to flowering, and 300-350 g from flowering to full seed formation. It

is during this period that soybean varieties are very sensitive to air and soil drought.

The total amount of water used for the production of a crop unit is called the water absorption (water absorption) coefficient. Soybean varieties also differ according to this indicator. The coefficient of water absorption is lower in water-supplied conditions than in drought conditions, especially in the critical phases of flowering and grain filling.

Resistance to excess moisture . When soil moisture increases, root aeration is disturbed, transpiration increases, the amount of chlorophyll in leaves decreases, the productivity of photosynthesis decreases, and grains are not filled. The amount of nitrogen in the plant varies by phase. During the weeding period, the plant does not grow well, aerial roots develop. If these conditions last up to 10 days, the plant will die. After two weeks, when the optimal humidity is restored, the plant continues to develop, but does not completely recover.

Heat resistance . Heat resistance, high intensity of photosynthesis and transpiration, reduces respiration. occurs due to the activity of enzymes. The increase in the amount of glutamic acid and its content of amidoglutamine serve to preserve ammonia and the initial formation of protein in heated leaves. In most cases, broad-leaved varieties are more damaged by heat compared to thinner varieties, which is connected with the difference in their leaf surface, to heat. related to the exposed leaf surface.

Cold tolerance varies during the growth and development phases during the application period. The most important thing in soybean cultivation is the cold tolerance of the grasses, during this period the soybean grass can withstand 3 °C cold. This feature of soybeans helps to choose the optimal planting period, taking into account the late spring frost. It was found that the variety samples of soybean have different cold resistance.

Soybean plant has been evaluated differently by scientists in terms of salt tolerance. According to some scientists, soybean is resistant to salinity when the

dry residue is 0.5% or chlorine content is not increased to 0.01-0.02%. If the amount of salts in the soil increases (1.0%), the plant will die, even if the amount of salt is 1.5%, including chlorine 0.03-0.10%, the lawn will not turn green. Soybean varieties are therefore not grown in saline soils that retain chlorine and sulfate salts. Due to the fact that soybean varieties have different salinity tolerance, it is advisable to carry out selective selection for salt tolerance in the selection work when creating new varieties.

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