BIOECOLOGICAL PROPERTIES OF RICE PLANTS

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Annotation: Rice is one of the most valuable food crops. It is the second largest crop in the world after wheat in terms of area and gross yield (Figure 1). Cultivated rice (*Oryza sativa L*) is divided into three subtypes - Indian (*indica*) grains thin long, Chinese - Japanese (*sina - japonica*) grains are divided into short, wide and Japanese.

Keywords: *Oryza, poaceae*, species, flower, root, development, temperature, humidity, family, spike, ecology, soil, light, phase

Introduction: The annual demand for grain in the country is 6.0-6.5 million tons. In the future, it is planned to increase grain production in the country, mainly through increasing productivity, development and introduction of accelerated growing technologies. The main Chinese-Japanese subspecies of rice is widespread in Uzbekistan (Figure 2). Each subspecies is subdivided into species according to a number of characteristics.

Figure 1. General view of rice husks and leaves.

Root system - buds and surface, the main root mass is located in a 25cm layer of soil. The roots, as well as the stems and leaves, also have air-filled tissue (aerenchyma). Therefore, the appropriate oxygen concentration is maintained in the rice plant. One plant can have up to 300 roots. Rice that is constantly trapped in the aquifer has fewer root hairs, whereas without a layer of water or from time to time in a flooded rice, there are a lot of root hairs. The number of roots, the degree of their development, the penetration into the soil pit depends on the variety, the external environment, the growing technology used. Stems hollow straw, 80-120 cm high, strongly clustered and often branched. The leaves are linear-lanceolate, ribbed, veined, the leaves are up to 35 cm long and 1.5-2 cm wide.

Sometimes submerged leaf joints form roots and provide additional nutrition. Inflorescence - flattened, 20–30 cm long. The spikes are single-flowered, their number is 80-200 in one row. The flower has 6 pollen grains and an elongated maternal knot. Rice is a self-pollinating plant. The grain is peeled, separated by a spike during grinding, with flowers and spikes.

Figure 2. Younger varieties of cultivated rice.

Biological properties. Temperature requirement. Rice is a heat-loving plant. The minimum temperature for seed germination is 10-140C. Live grasses are formed at 14-150C. The minimum temperature in the accumulation phase is 15-180C, in flowering - 18-200C, at the beginning of grain ripening - 19-250C. The optimum temperature for plant growth and development is 25-300C, the maximum temperature is 400C. Low temperatures strongly inhibit plant growth and development. If the temperature is below 17-180C, the grains will not ripen.

Humidity requirement. Rice is hygrophyte by its ecological nature. The rice plant retains less water in its tissues than cereals that grow in dry conditions. Therefore, even if the tissue is small, it cannot withstand dehydration. Humidity is high in the air layer close to the soil surface. This reduces rice transpiration. In Uzbekistan, 450-550 g of water is used to produce 1 g of dry matter. The aquifer promotes the accumulation of essential nutrients for rice - ammonia nitrogen, mobile phosphorus and potassium. Submerged rice cultivation has historically been associated with high and stable yields.

Figure 3. The moisture requirement of rice.

Light demand. Rice is a short-day plant, but requires a lot of light. For varieties grown in our country, the duration of sunlight is 9-12 hours, lack of light slows down the development of rice and, consequently, reduces the yield. However, early maturing varieties are weakly affected by the length of the day.

Soil demand. Rice is one of the less demanding plants in the soil, it can be grown in swampy meadows, peat, loam and other soils. Especially the river valleys, which are washed away for rice, have heavy, muddy mechanical composition, and soils rich in organic matter are very inconvenient. Swampy and sandy soils are suitable for growing rice. Young rice grasses die if the salt content is more than 3% by weight of dry soil, chlorine salts (NaCl) by 0.3%, and sodium carbonate by more than 0.1%.

Demand for nutrients. Rice is demanding on nutrients. When minerals are added, the amount of nutrients in the soil increases. When nitrogen is low in the soil, rice accumulates poorly, the stalks are small and the number of grains is small. Rice is very demanding on nitrogen from weeding to ripening. Lack of phosphorus in the soil leads to disruption of physiological metabolic processes, protein synthesis. Phosphorus deficiency reduces the intensity of accumulation. The leaves are narrow and slender. Soil yields the most potassium. Potassium deficiency reduces dry matter accumulation. Most potassium is absorbed from the end of the accumulation phase to the flowering phase. In addition to essential nutrients, rice needs small amounts of sulfur, iron, calcium, zinc, copper, molebden, manganese, and other nutrients.

Phases of development. Sprouting is characterized by the fact that the seeds absorb 23-28% of their weight in water. The soil and water temperature should not be less than 11-120C. When the seeds are well oxygenated (3%), they begin to sprout. This condition occurs when the water layer is not very thick. When the water is deeply pressed, the grass is sparse. To prevent this, after the grain has germinated, water is released in non-saline areas. In saline soils, the water layer is reduced by 3-5 cm. This improves the oxygen supply to the growing seeds and accelerates germination. Rice seeds can germinate even without oxygen, and its need for oxygen begins later, with the formation of rhizome roots and leaves.

Sprouting. This phase begins at the end of the bud and lasts until 3-4 leaves are formed. During this time the root system develops rapidly, from the leaf axils to the buds of future branches. Aerenchyma is formed in the roots. In Uzbekistan, this period lasts 7-10 days. The slope of the grass and the formation of the optimal bush thickness depend on the energy of seed growth, soil and water temperature, as well as water regime and light supply. Deep immersion and storage have a negative effect on root development.

The accumulation phase begins with the formation of 3-4 leaves on the plant and continues until the formation of stems. This phase lasts 25-30 days, and in some varieties even longer. Rice has a large ability to accumulate, the side branches are formed in the leaf axils. In terms of productivity, the pods formed in the axils of 1–5 leaves are not inferior to those of the main branch, and may be superior to them in the size of the seeds. The lateral branches, formed by the next leaf axils, have fewer grains and ripen later. The generative period begins in the middle of the accumulation phase. The number of spikes in the ovary is equal to the number of spikes in the mature spike. High water temperatures and a lack of nitrogen lead to smaller stalks and reduced grain numbers. The intensity of accumulation is a sign of variety. But it depends on the irrigation regime, nitrogen nutrition, the amount of oxygen on the soil surface, air temperature, water temperature, bush thickness.

Tubing phase. In rice, 8–9 - begins with the formation of leaves and ends with the emergence of the last flag leaf. During this phase, the upper bouts featured two cutaways, for easier access to the higher frets. The plant grows to its maximum during this phase. The accumulation coefficient averages 1.8-2.2 per plant.

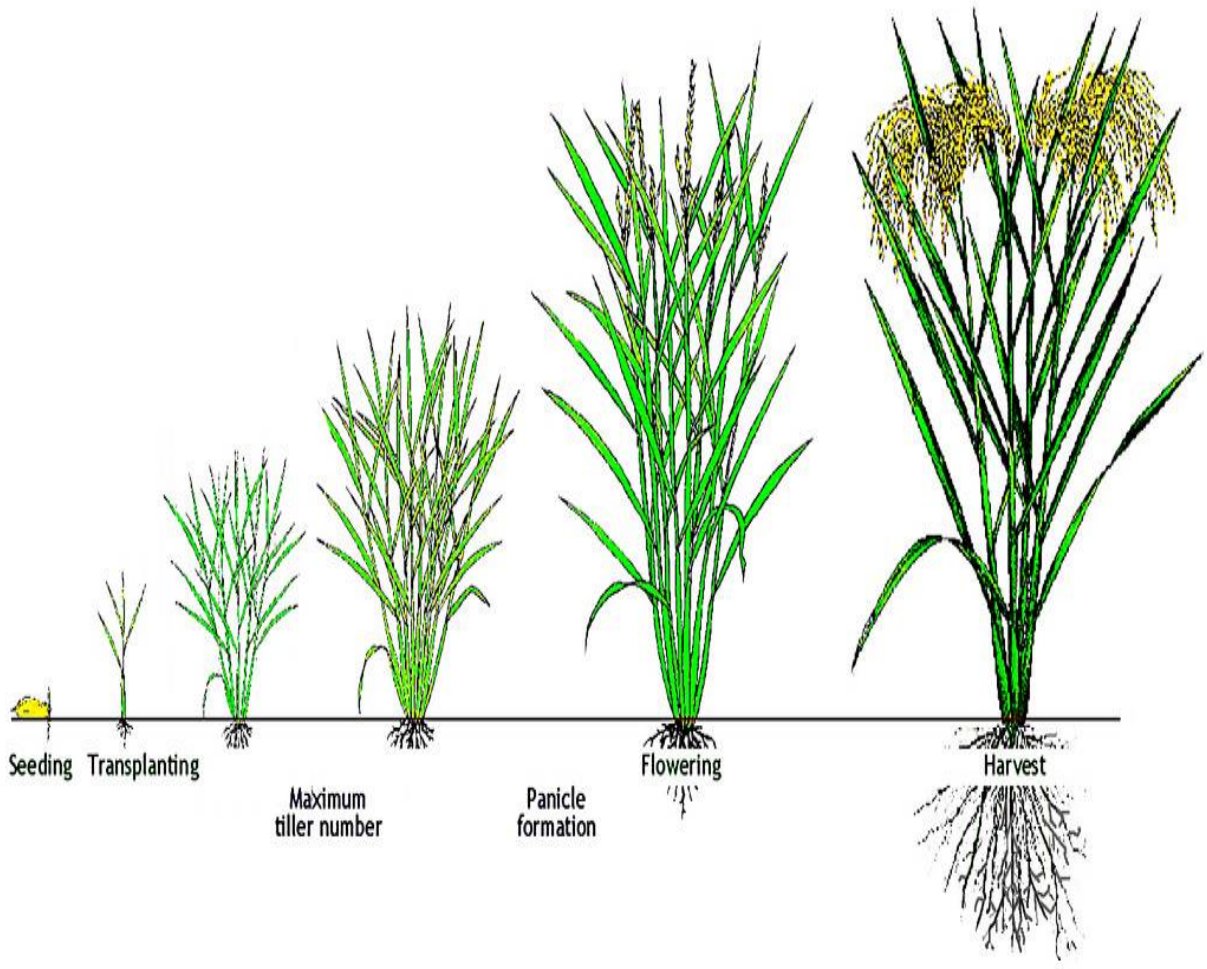

Figure 4. Phases of rice development.

The flowering and flowering phase. It is marked by the beginning of the emergence of the main rocvak from the leaf sheath. In rice, flowering and mating coincide in time, so they combine. On this day or the next day, the spikes at the top of the canopy begin to bloom. This phase ends with the flowering of the lower ears of the rhizome. The flowers are pollinated open and closed. In Uzbekistan, rice flowers are openly pollinated. Cloudy weather, wind, rainfall, and low temperatures slow down growth, flowering, and fruit set. During these phases, the water layer in the rice should not be less than 8-10 cm. Otherwise, non-grain spikes and empty grains will increase.

Baking is divided into milk, wax and full cooking stages. The upper bouts featured two cutaways, for easier access to the higher frets. Milk ripening is accelerated when the average daily temperature is 18-200C. During this time, the plant is green, the grains are shaped along the length and width, and the inside of the grain is filled with a milky liquid. It takes 10-12 days from pollination to the end of cooking, sometimes even longer. During this time, 60% of the water in the grain is colored, and no fibrous fibers are formed.
When the wax ripens, the plant turns green and only the spikes turn yellow. At this time, fibrous fibers are formed, the humidity can be 25-30% or more. When the grain is crushed, a nail mark remains. This phase lasts 10-15 days.
When fully ripe, the grains turn a typical color for the variety, but are cut with a nail to form a dry paste. Grain moisture is reduced by 14-15%. Wax and full baking phases pass well at 16-180C. The ripening phase lasts 30-40 days, sometimes longer, and it depends on the variety, soil and water temperature. The transition from one phase of plant development to another is related to metabolism. Therefore, the plant's demand for heat, moisture, nutrients and other factors varies according to the phases of development.
The number of rice varieties is very high in countries where rice is grown.

In Uzbekistan, the varieties of rice UzROS - 7-13, Lazurniy, Avangard, Tolmas, Gulzar, Nukus - 2, Jayhun, Alanga, Arpa rice, Istiqlol, Istiqbol, Sanam are included in the State Register.

Conclusion

In short, the supply of food to the population is one of the most pressing issues facing all countries today. Cereals are one of the most popular. Doing a lot of research to solve such problems, creating new varieties of cereals that are nutritious, resistant to environmental changes, and studying many unexplored sectors will lead to the solution of our problems today.

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