PHASES OF DEVELOPMENT AND GROWTH OF CEREALS

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Annotation: *Cereals contain all the nutrients necessary for human life, including protein, starch, vitamins, carbohydrates, fats, destrin, mineral salts, klechatka, carbonated waters and other biologically active substances. More than 1 billion hectares of land are cultivated around the world. Grain crops are grown on more than 70% of these arable lands. In the current complex environment, which is rich in economic problems, a lot of work is being done to increase the area under cereals and to cultivate varieties that are adapted to different environmental conditions.*

Keywords: *Cereals, development, flower, seed, bud, phase, orgonogenesis, stem, apricot, grass, plant.*

ФАЗЫ РАЗВИТИЯ И РОСТА ЗЛАКОВЫХ

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Аннотация: *Зерновые культуры содержат все необходимые для жизнедеятельности человека питательные вещества, в том числе белок, крахмал, витамины, углеводы, жиры, дестрины, минеральные соли, клечатку, газированные воды и другие биологически активные вещества. Во всем мире возделывается более 1 миллиарда гектаров земли. Зерновые культуры выращиваются на более чем 70% этих пахотных земель. В современных сложных условиях, богатых экономическими проблемами, проводится большая работа по увеличению посевных площадей под зерновыми и выращиванию сортов, адаптированных к различным условиям среды.*

Ключевые слова: *Злаки, развитие, цветок, семя, почка, фаза, оргоногенез, стебель, абрикос, трава, растение.*

Introduction: Cereals go through a number of stages of organogenesis during individual development, and each of them is characterized by the formation of new

organs and changes in the structure of the organs. The life cycle of plants is determined by F.M. Cooperman is divided into 12 stages of organogenesis:

1. the initial formation of the stem growth cone;
2. to the stem joint and joint spaces in the conical shape of the cone division;
3. of the growth cone with the formation of spike segments elongation;
4. the onset and formation of spikes;
5. formation and division of flower buds;
6. formation of dust grains and seed sporogenic tissue;
7. Rapid growth on all organs of the ear;
8. end of spike, spike and flower formation;
9. flowering, fertilization, formation of zygotes;
10. Growth and formation of seed organs and grains;
11. Nourish the grain from the milky ripening phase of the grain to the ripening of the wax accumulation of substances;
12. Concentration of nutrients, seed maturation.

Cereals go through the following developmental stages during growth: seed germination, germination, accumulation, germination, germination or germination, flowering and ripening (milk hardness, wax hardness, full hardness). The beginning of a phase when at least 10% of a plant enters a certain phase and 75% when a plant enters a certain phase is defined as a complete phase. Other dimensions of plant development are also used in world agriculture. On such scales and dimensions, the developmental phases are divided into short periods - microphases, and they are marked from 0 to 99. The scale of development microphases allows to control the development processes of spikes, cobs, flowers and grains separately, and on this basis to organize the care of crops, to grow a rich and quality grain.

Seed swelling. When there is enough moisture, heat, air oxygen, the seeds begin to germinate (Fig. 1). Absorption of water is accelerated in the aorta. As a result of the seed not absorbing water evenly, the seed coat cracks during germination.

Under the action of enzymes, starch, fats and proteins are broken down into water-soluble compounds and pass through the thyroid gland. The water requirements of germinating seeds vary. For seed germination (% of dry weight of seeds) wheat 47-48% by weight, barley 48-57%, rye 58-65%, oats 60-70%, corn chorus absorbs 37-44%, millet and white oats 25-38% water. Seeds of legumes absorb 100-125% of their weight in water for germination.

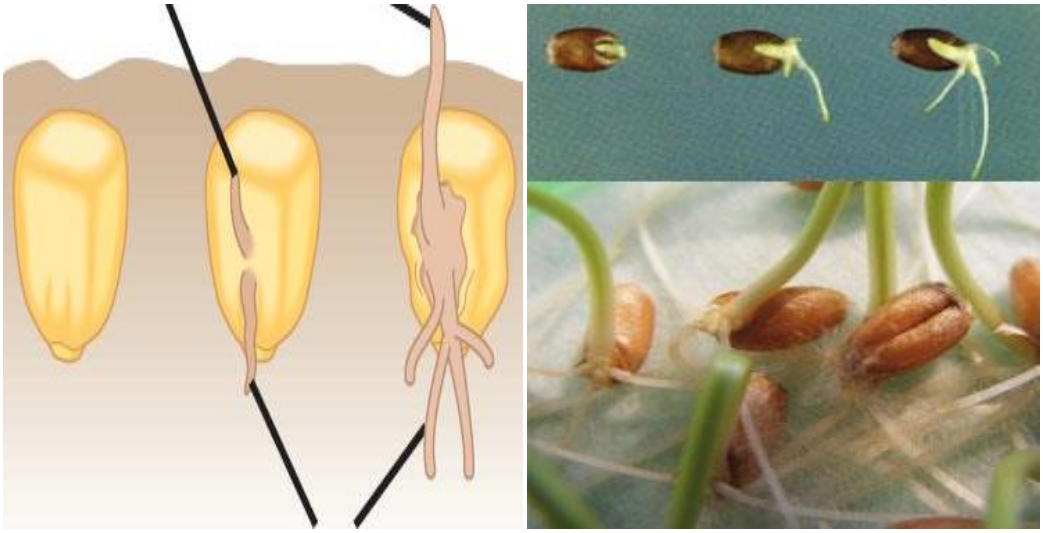

Figure 1. Seed germination:

1 - corn; 2 - wheat.

Mowing. In germinating seeds of cereals, first the rhizome roots and then the stem develops. Initially, a stalk is formed on the surface of the soil. It is surrounded by a clear leaf - kaleoptile. The first leaf stops growing after 6–14 days. After about a week the second leaf is formed from the first leaf axilla, and after that time the third leaf is formed, and they are called apical leaves. At the same time the apical roots also begin to develop and penetrate to a depth of 30-35 cm. Wheat grass is green, rye is green, barley is blue, oats and the second group of cereals are light green. The rate of grass formation varies depending on the grain growth energy, humidity, temperature, soil mechanical composition, planting depth, grain size.

Accumulation. The formation of branches from the underground joints of the stem is called accumulation. At the base of the stem joints are formed joint roots (additional), then side branches. They can be formed from all the joints under the stem, but the most common are the joints located at a depth of 1-3 cm above the soil surface. The highest, most advanced joint is called the accumulation joint. From it emerge the main side branches and additional roots that form the bud root system. In wheat, rye, barley underground joints are formed in 5–7 days of grass formation. In cereals and oats - they are formed at the same time (grass). The accumulation node of the plant depends on the accumulation of the plant, the development of the root system, drought, winter hardiness, productivity and other characteristics. Death of the accumulation node leads to the death of the plant. The number of stems (branches) in a single plant is called the total accumulation.

Under favorable conditions, 6-12 or more branches are formed on a single plant. Typically, in Uzbekistan, in autumn, grain crops produce 2-6 twigs per plant, and in spring - 10-12 twigs, which is 2-4 in spring crops. In practice, the number of stalks that produce (give grain) is important, and their number is called the productive accumulation. However, some spikes produce grains, but they do not ripen. Immature stalks and unripe stalks are called immature stalks. In fertile soils, high-yielding plants typically produce productive stems that produce 2-3 spikes from 4-7 stems. Wheat stalks are large, forming a large number of grains. Accumulation and accumulation energy depends on plant type, navigation, seed size, feeding area, soil moisture, sowing time, soil quality and fertility, light, temperature, fertilization. Accumulation begins differently in different grain crops. Accumulation in oats and rye begins with the formation of 3–4 leaves on the plant, shortly before the joints in wheat and barley take root, with the formation of 3 leaves, and rooting takes place with the formation of 4–5 leaves. corresponds to.

Accumulation in maize corresponds to the formation of twigs in the 6-7-leaf phase, in white oats to 7-8, in millet to 5-6 leaves. The appearance of articular roots in tariqman grain crops corresponds to the formation of 3-4 leaves.

Tubing (stem formation). In cereals, the stem begins to develop during the accumulation period. The joint space at the base of the auricle begins to be felt (Fig. 2). The beginning of tubing is defined as the beginning of the elongation of the main stem joint space and when the first joint of the stem rises 5 cm above the soil surface. This is felt by palpating the joint.

Initially, the lower joint space begins to lengthen. Then the second joint space begins to grow and it becomes longer than the first. The spacing of the next third joint will be longer than the second, and so on. This process continues until 5-7 joint spacing is formed (15 and more in corn). Each joint space of the stem grows from the lower part - the intercalary. Usually, the stems stop growing at the end of the flowering period, at the beginning of grain filling. The first group of cereals has 4–7 joints at the base, while rice, corn, and corn have much more. The tubing phase begins when the upper joint rises at least 5 cm above the ground. To find out, you can cut or feel the leaf column.

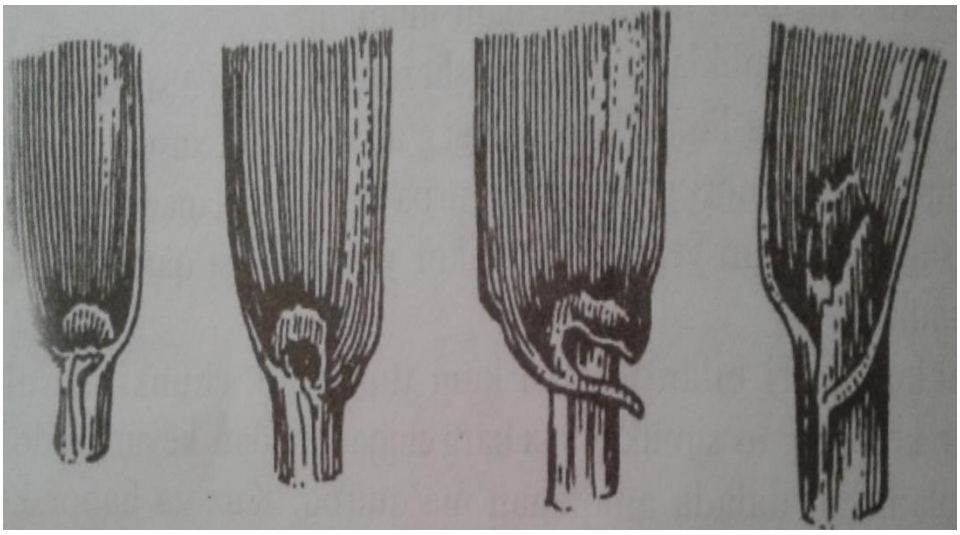

Figure 2. Ears and tongues of cereals:

1 - rye; 2 - wheat; 3 - barley; 4 - rice.

Sprouting. With the appearance of 1/3 of the spike from the upper leaf sheath, the spike phase begins. From the tuber to the spike phase, the stems and leaves grow rapidly, forming spikes (Fig. 3). Therefore, the plant is very demanding on nutrients, water during this period. The size of the grain is greatly affected by the ratio of mineral nutrients. During the accumulation period, when nitrogen is predominant in the diet, the elongation of the growth cone is prolonged for several days and many

spikes are formed in the spike. When phosphorus predominates, spike formation is accelerated and spikes are formed less in the spike. Therefore, nutrients should be added to the soil in the right proportions.

Flowering. The plant begins to bloom after flowering. Only if the autumn rye blooms 8–10 days after the start of germination, the barley will bloom until full germination. Grain crops are divided into self-pollinated (wheat, barley, oats, millet, rice) and pollinated (rye, buckwheat, corn, white corn) according to the characteristics of flowering. The pollen of self-pollinating cereals usually cracks before it blooms. Therefore, they are self-pollinating. The most hardy crop is barley.

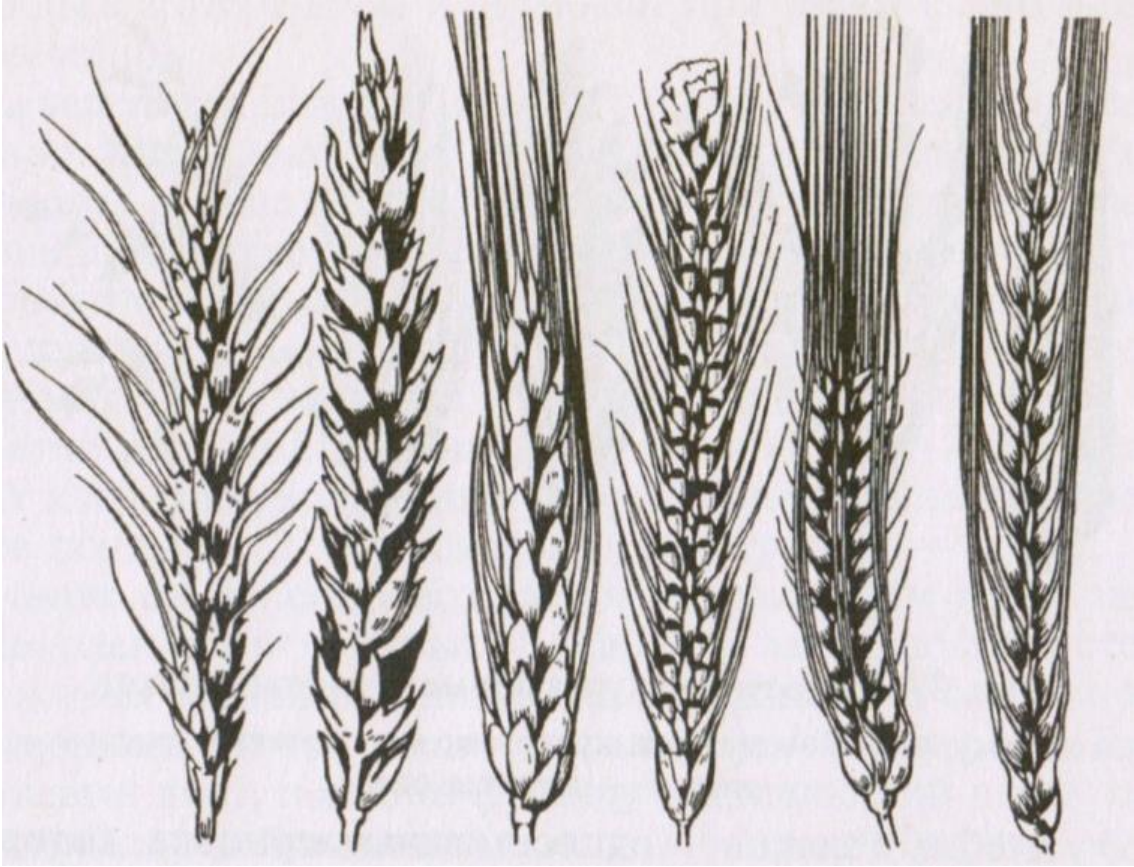

Figure 3. Appearance of grain ears:

1 - soft wheat with a fork; 2 - soft wheat without stalks; 3 - durum wheat; 4 - rye; 5 - barley; 6 - 7 - multi-row vaikki row barley.

When the weather is hot and dry, wheatgrass bark can bloom in the open, and this is observed in the morning. In adverse weather conditions (cloudy and rainy) flower

petals can bloom indoors. In foreign pollinated crops, the pollen matures and cracks after flowering. In rye, its light dust is shed and blown away by the wind, and the seed of other plant flowers falls on its beak and fertilizes them. Fertilization does not occur if the dust falls on the flower bud of this plant. In maize, the paternal heifer ripens and the maternal heifer ripens 2-4 days before sowing. The pollen of the paternal inflorescence falls on the beak of the threads that protrude from the maternal inflorescence, and sprouts on the ground and enters the node of the maternal inflorescence and fertilizes the seed bud.

In cereal crops (wheat, barley, rye) flowering begins with the spikes in the middle of the ear. The grain and seed qualities that are initially formed will be the highest. In ryegrass crops (millet, oats, white corn) flowering begins in the third part of the rye, the best, quality grains are formed in the third part of the rye.

Maturation (ripening). After fertilization, the flower begins to develop into a nodule, seeds and ovules are formed. The nutrients accumulated in the leaves are used for grain formation. In this case, they change from a soluble form (sugar, amino acids, etc.) to an insoluble form (starch, protein, fat). The process of grain formation is divided into four stages: formation, formation, filling, and ripening. Seed formation - Continues from fertilization to the formation of a growth point. In this case, the seed forms a weak tumor. 1000 seed mass 1 g. The duration of the period is 7-9 days and more.

Seed formation - lasts from seed formation to the final length of the grain. The seeds are high in water and low in dry matter. 1000 seed weight 8-12g. Filling is the process from the beginning of starch accumulation in the endosperm to the end. Grain moisture is reduced to 37-40%. The duration of the period is 23-35 days. The period of seed formation, formation and filling is also called the period of milk ripening. In this case, the grain is fully formed and organic matter continues to accumulate. The fleas on the underside of the plant turn yellow. The grains are green. The filling period is also divided into four phases.

1. In the aqueous phase, the formation of endosperm cells begins. 2-3% of the maximum amount of dry matter is accumulated. Phase duration is 6 days.

2. In the pre-milk phase, the seed is filled with milky aqueous fluid, accumulating 10% of the total dry matter. Phase duration is 6-7 days.

3. In the milky phase, the grain is filled with a milky white liquid and 50% of the dry matter in the ripe seed accumulates. Phase duration is 7-15 days.

4. In the yeasty phase, the endosperm consistency is yeasty. The dry matter content is 85-90% of the ripened grain mass. Phase duration is 4-5 days.

The cooking period is divided into two phases:

1. In the wax maturation phase, the endosperm is waxy, brittle, and easily cut with a nail. Grain moisture is reduced to 25-30%, the duration of the phase is 3-6 days. In this case, the amount of nutrients accumulated in the grain differs little from the period of full ripeness of the grain. This period can be prolonged when the weather is cold. This period is the most convenient time to harvest in two phases - first harvested and then crushed.

2. In the solid hardening phase, the endosperm enlarges, becomes vitreous or opaque, the color is typical for this grain, the humidity is 8-22%. Phase duration is 3-5 days. At this stage, complex biochemical processes take place in the grain, and the seeds have normal germination. Therefore, two additional periods are distinguished: ripening after harvest and full ripening. During the ripening period after harvest, the synthesis of high-molecular protein compounds is completed, free fatty acids are converted into fat, the hydrocarbon molecule is enlarged, respiration is slowed down. . At the beginning of this period, the germination of seeds is low, and at the end it returns to normal. Its duration lasts from a few days to several months and varies depending on the type of crop and external conditions. The full ripening period begins when the seed germination reaches its maximum. In irrigated lands, in sparse crops, in temperate weather conditions, grain ripening is much slower and more continuous. In dry and hot weather, when planted early, when the stems are thick, when the phosphorus-potassium fertilizers are applied, the grain ripens earlier. Garmsel, high temperatures, lack of moisture in the soil - lead to "soil drought" and "air drought". This stops the filling of the grain, the grain becomes small, twisted, useless, the yield and its quality decreases sharply.

Conclusion

Cereals are of great economic and production importance in the national economy of the Republic of Uzbekistan. Cereals play an important role in meeting the food needs of the population, providing livestock with concentrates and mixed feeds, and raw materials for some industries.

Increasing grain production is one of the main problems in agriculture. After the independence of the Republic of Uzbekistan, a number of practical measures have been taken to increase grain production, meet the demand of the population and the national economy for grain at the expense of grain grown in the country, decrees and laws have been adopted.

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