DEPENDENCE OF WHEAT PHYSYNTHETIC ACTIVITY IN RAINFED LAND ON SOWING STANDARTS

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ABSTRACT

The article describes the dependence of photosynthetic indicators of Mingchinor and Yakut-2014 varieties of durum wheat on the sowing norms in the hilly conditions of rainfed farming.

Keywords: rainfed farm, hilly region, durum wheat, sowing norm, variety (Mingchinor, Ruby-2014), leaf surface, photosynthetic potential, dry matter, pure photosynthetic productivity.

INTRODUCTION

All green plants are distinguished by their photosynthetic activity, which is characterized by the continuous accumulation of organic matter and the release of oxygen into the air throughout its life. This, in turn, determines the growth and development of plants and, most importantly, their productivity.

The initial process of organic matter formation is the basis of photosynthesis-plant nutrition. During photosynthesis, 80-90% of the dry mass reserve of biological product is formed. Therefore, the growth, development, yield of the plant is directly related to the transition process of photosynthesis.

In agriculture, most measures will be aimed at the efficient and effective use of the photosynthetic apparatus in all its work. The timing and rate of sowing from agrotechnical methods are important in creating conditions for the smooth passage of the process of photosynthesis. Optimization of sowing times and norms is of great importance in obtaining high yields from all agricultural crops, including wheat sown in autumn.

Field experiments were carried out on the basis of the program in the conditions of the farm "Yashin-Yamin" in the rainfed land of hill region (Yakkabag district of Kashkadarya region).

MATERIALS AND METHODS

New Mingchinor and Yakut-2014 varieties included in the State Register of durum wheat were tested in the rainfed land of hill regions. Yokut-2014 variety was the object of experiments.

In the experiment, for the sowing norm of winter wheat was applied 2.0; 2.5; 3.0 and 3.5 million seed per hectare. Field experiments were performed in the following ways: 4 replications and each one was 50 m^2 and 2-tier were planted. In the experiment, plant care was carried out on the basis of agro-techniques adopted for the region. All phenological observations and biometric measurements made in the field experiment were used in the guidelines of UzPITI "Methods of conducting field experiments" [1; p. 145]. V.Orlov's method was used to calculate the leaf surface. The photosynthetic potential of crops (EFK), the net productivity of photosynthesis was determined by the methods of A.A. Nichiparoich [3; 135-s.]. Analysis of variance of data obtained on productivity by the B.A. Dospekhov method [2; 356-s].

RESULTS AND DISCUSSION

Leaf surface and photosynthetic potential. One of the main indicators of photosynthetic activity of wheat is the size of the leaf surface and the dynamics of its formation. High yields can be obtained only from a crop that dynamically forms the optimal leaf surface, can work for a long time, during the entire growth period. For this purpose, in the conditions of specific growth for each plant, the optimal bush thickness, feeding regime is created in order to have the most favorable growth, development, photosynthetic potential during the growth period. In this case, all agro-technical methods should be aimed at creating an optimal leaf surface on the plant, as well as the formation of a crop with photosynthetic capacity, which is active for a long time.

In irrigated lands, the surface area of durum wheat varies depending on many external factors, including planting norms. In our experiments, the leaf surface of durum wheat increased with increasing planting norms. When sowing 2.0 million seeds per hectare during the solid wheat accumulation phase, the leaf area per 1 hectare is 1 m^2 at 0.69 leaf surface was formed.

In the later stages of plant development, the leaf area per 1 m^2 increased in all planting norms. This figure was the highest in the sprouting phase. In plant development phases, the largest leaf surface was observed in the sprouting phase. In the germination phase, the sowing rate was 5 m^2 with 2.0 million seeds per hectare, while the sowing rate was 5.54 m^2 when the sowing rate was increased to 3.5 million seeds. The largest leaf surface area was observed in 3.5 million planted crops per hectare.

In the field, the leaf surface of 1 m^2 of plants decreased in the flowering, milk, become hard ripening phases due to the early yellowing of the leaves in the lower part of the plant. Depending on the planting norms, the leaf area of 1 m^2 changed from 0.95 to 1.99 during the hard ripening phase. The leaf surface and foliage of the plant do not always indicate the size of the crop. V.S.Sheveluxa, Vaska P.P. such authors emphasize that photosynthetic potential and productivity are closely related. For most cereals, including wheat, the optimal surface area of leaves per 1 hectare has been determined, 40-50 thousand sq/m, and the optimal photosynthetic potential should not be less than 2 million sq/m per day [6; 107-s.].

In our experiments, the photosynthetic potential of wheat varied according to planting norms. In durum wheat, the greatest photosynthetic potential was observed in the germination phase of the plant. From the spring accumulation to the flowering phase, the photosynthetic potential increased.

Accumulation of dry matter. The productivity of the growing organs of plants is strongly influenced by external environmental factors: light, heat, humidity, lack of nutrients. Lack of these factors reduces the rate of accumulation of dry matter in the plant, which reduces crop yields [8; 18-s, 3; 135-s., 9; 227-233-s.].

During the growth process, the yield of plants is determined by the accumulation of dry matter. The accumulation of dry matter during the day according to the phases of plant development varies depending on the leaf surface and the net productivity of photosynthesis.

According to many researchers, the maximum dry matter accumulation of wheat corresponds to the germination phase. In our experiments, the accumulation of dry matter before the flowering phase also increased with the increase in planting norms. By the time of the flowering phase alone, the sowing rate had dropped from 50.6 to 54.1 ts / ha when 2.0 million seeds were sown per hectare. This is mainly due to the strong accumulation of sparsely planted plants, thickening of the stems and yellowing of the lower leaves [6; 30-s, 10; 62-b, 4; 265, 5; 432.].

In our study, the highest accumulation of dry matter in the durum wheat crop coincided with the becoming hard ripening phase of the grain at all norms. Then there was a decrease in the accumulation of dry matter due to drying and falling of the leaves, as well as the leakage of plastic, nutrients from the surface organs to the roots.

Pure productivity of photosynthesis. Pure productivity of durum wheat photosynthesis depends not only on the size of the plant assimilation apparatus, but also on the duration of its operation and the intensity of leaf work
[3; 135-s.].

During the growth, the net productivity of photosynthesis varies in plants to plants. At the beginning of plant development, it was not high, and then gradually increased to the flowering phase. From the flowering phase to the become hard ripening phase, photosynthetic net productivity decreased.

Table 1. Pure productivity of wheat photosynthesis, g/m² (2018-2020 years)

Sowing rate is one million seeds.	Phases of development						Average vegetation
	Tillering	Stem elongation	Heading	Flowering	First stage of ripening	Last stage of ripening	
'Ming chinor'							
2,0	-	4,70	3,82	6,83	4,51	3,10	4,59
2,5	-	4,65	3,70	4,76	4,01	2,23	3,87
3,0	-	4,57	3,51	4,25	3,81	2,00	3,63
3,5	-	3,41	3,30	3,91	3,52	1,82	3,19
'Yakut-2014'							
2,0	-	4,50	3,69	6,62	4,44	2,97	4,44
2,5	-	4,42	3,56	4,51	3,90	2,10	3,69
3,0	-	4,34	3,34	4,01	3,62	1,82	3,42
3,5	-	3,20	3,13	3,52	3,40	1,65	2,98

In the heading phase, the largest leaf surface was observed in the area planted with durum wheat. However, during this period, the net productivity of photosynthesis decreases relative to the stem elongation phase (Table 1). As the plant bush thickness increased, the net productivity of photosynthesis decreased. Pure photosynthesis yield of durum wheat in 'Ming chinor' and 'Yakut-2014' varieties, sowing norm is 2.70 million seeds per hectare, according to varieties, 4.70; At 4.50, the sowing rate was 3.41; 3.20 g/m^2 with 3.5 million seeds.

The highest photosynthesis net yield in the germination phase was observed when 2.0 million seeds were sown per hectare. With increasing planting rates, the net productivity of photosynthesis decreased. The highest photosynthetic net productivity in the flowering phase was 6.83, depending on the variety, when the sowing rate was 2.0 million seeds/ha; 6.62 and 2.5 million seeds/ha, respectively, 4.76; 4.51 g/m^2. An increase in the sowing rate of 3.0 and 3.5 million seeds/ha per hectare led to a decrease in the net productivity of photosynthesis. In the next developmental phase, the net productivity of photosynthesis in first stage and last stage maturation decreased.

In our experiments, the net productivity of photosynthesis varied from 4.59 to 2.98 g/m^2 during the growing season of durum wheat.

CONCLUSION

Based on the results obtained, it can be concluded that the photosynthetic activity of ‘Ming chinar’ and ‘Yakut-2014’ varieties of durum wheat grown in rainfed conditions depends significantly on the planting norms.

In the mountainous region of rainfed lands, high-quality grain of durum wheat varieties ‘Ming chinar’ and ‘Yakut-2014’ was sown in the third day of October, when 2.5 million seeds were sown per hectare. In this case, the net productivity of photosynthesis, leaf surface, photosynthetic potential was thousand m^2/day.

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