PHOTOSYNTHETIC ACTIVITY OF DURUM WHEAT ON IRRIGATED LANDS AT DIFFERENT TIMES AND SEEDING RATES

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ABSTRACT

The article presents the results of research on the dynamics of the formation of leaf area, photosynthetic potential, the accumulation of dry biomass and net productivity of photosynthesis durum wheat sort Krupinka depending on the timing and rate of sowing the irrigated lands in the southern region of Uzbekistan.

Keywords: Durum wheat, planting dates, planting rules, leaf area, photosynthetic potential, net productivity, photosynthesis, dry biomass of irrigated land, variety, grain yield.

INTRODUCTION

Photosynthesis is considered the main power plant in the formation of primary organic substances. In the process of photosynthesis is formed and accumulates 80-90% of the stock of dry biomass. Therefore, growth, development and yield of plants depends on the passage of the process of photosynthesis.

It has important agronomic factors such as the timing of sowing seed rate to create optimal conditions in the passage of the process of photosynthesis.

Great importance is to optimize the timing of sowing seed rate in obtaining high yields in all crops as well as wheat.

Irnazarov Sh. I. [4] and other authors believe that can be controlled by controlling the photosynthetic activity of farming practices.

The optimal value of the leaf surface changes a lot of external factors, including variety, growing conditions, planting dates and plant density [1, 10, 11].

One of the main indicators of photosynthetic activity of photosynthetic leaf area and its dynamics of formation. The highest harvest is possible to form an optimum value of leaf area in sowing that work throughout the growing season and a long time. Therefore, each plant under specific conditions during the whole period of the growing season

for optimum development, with a strong photosynthetic capacity are the optimum plant density, nutrient regime. Here are all agricultural practices should be designed to create the optimum leaf area, and actively working a long period of time.

MATERIALS AND METHODS

The experiments were conducted in 2015-2017 irrigated typical serozem soils of the farm "Ravshanova Tumaris", Chirakchi district of Kashkadarya region. The objects of research of durum wheat sort Krupinca. The following planting durum wheat were studied in the experiments: September 20, October 11 and November 1 at seeding rate is 3.0; 4.0; 5.0 and 6.0 million viable seeds/ha. Field experiments were carried out in a 4-fold repetition, the accounting area of 50 m^2 plots, location of plots in two-levels. The predecessor to the experience was the corn.The experiments were applied to wheat cultivation technology of irrigation adopted in this area. Leaf area taken into account by the method of V. Orlov. The photosynthetic potential and net photosynthesis productivity determined by the method of A. A. Nichiporovich [7].

Observations and biometric surveys implementation in two non-contiguous duplicate, phonological observations were carried out according to the procedure Uzbekistan Scientific Research Institute of Cotton [2]. The experimental results were processed by dispersion and correlation analysis [3].

RESULTS AND DISCUSSIONS

In experiments (Table 1) in all planting dates with increased seeding rates of leaf surface area of durum wheat increased.

In the phase of tillering durum wheat crops on 21 September the rate of 3.0 million viable seeds/ha, determined of leaf surface area per hectare 2.80 thousand m2 or formed 1 m^2-2.8m^2 of leaf surface. These patterns were observed in planting dates 11 October and 1 November.

Further phases of the development of durum wheat in all terms and regulations of the leaf surface area sown to grow. The highest rate was observed in earing phase. The maximum value of leaf area reached in earing phase.

When sowing october 11 at the rate of 3.0 million viable seeds per hectare in phase.

Table 1 The dynamics of leaf area of durum wheat in depending on the timing of sowing seed rate (2015-2017), m^2/m^2

Dates of sowing	Seeding rates million viable seeds/ha	Phases of development							by vegetation
		the spring bushing	access to the tube	earing	flowering	milk ripeness	wax ripeness	Entireli ripeness	
21.09	3.0	1.90	3.10	5.22	3.02	2.44	1.10	-	2.80
	4.0	1.96	3.29	5.48	3.31	2.66	1.41	-	3.02
	5.0	2.02	3.63	5.79	3.57	2.94	1.77	-	3.29
	6.0	2.08	3.88	6.03	3.82	3.24	2.01	-	3.51
11.10	3.0	1.78	3.97	6.13	4.00	3.33	2.16	-	3.56
	4.0	1.94	4.12	6.38	4.36	3.47	2.24	-	3.75
	5.0	2.32	4.44	6.71	4.65	3.66	2.40	-	4.03
	6.0	2.45	4.49	6.82	4.76	3.74	2.39	-	4.11
1.11	3.0	0.75	2.97	5.11	3.14	2.46	1.23	-	2.61
	4.0	0.97	3.49	5.28	3.32	2.67	1.29	-	2.84
	5.0	1.19	3.96	5.49	3.50	2.84	1.42	-	3.07
	6.0	1.41	4.49	5.65	3.61	3.02	1.54	-	3.29

Earing phase leaf area reached 6.13 m^2, with increasing seeding rate of up to 6.0 million viable seeds/ha were equal to 6.82 m^2. This pattern was observed in other times of planting and seeding rates. Under optimal timing of sowing experienced the highest leaf area. In the early and later stages of crop in all seeding rate was observed a decrease in leaf surface area of 1 m^2 of leaves. The phases of the flowering development, dairy, wax ripeness plants in crops m^2 leaf area decreased due to occur in the lower parts of the yellowing of the leaves and dried. Depending on the timing of planting and seeding rate in leaf surface varied from 1.10 to 1.29 m^2. The area of leaf area and plant many deciduous all show the value of the crop. Keldiyarova H.H. [6], Irnazarova N.I. [5], Maxmatmurodov A, Mashrabov M. [9], Rizayev Sh.X. [10], Oserboeva T and other authors [8] believe that the photosynthetic potential and productivity, independent of each other.

Optimum leaf area is defined in a lot of crops, including wheat should be at least 40-50 thousand m^2, and photosynthetic capacity of 2 million m^2/ha. days.

In our experiments, the photosynthetic capacity of durum wheat varied depending on the sowing date and seeding rate (2 table). The highest photosynthetic capacity of the plants was observed in the phase of

earing durum wheat. Photosynthetic capacity was increased with the development phase of tillering to flowering phase.

In the experiments we observed the highest photosynthetic capacity in the optimal timing of sowing. Photosynthetic capacity was increased in all sowing dates with increased seeding rates. When sowing October 11 at a seeding rate of 3.0 million viable seeds/ha during vegetation photosynthetic capacity amounted to 3283.6 thousand. m^2/ha. days. with increasing seeding rate of 6.0 million viable seeds/ha equal to 3701.7 thousand. m^2/ ha. days.

Early or late sowing of the optimal time for all seeding rates reduced photosynthetic capacity.

During the growing season the accumulation of dry plant biomass yield sets. Depending on the area of leaf surface and the net productivity of photosynthesis varies accumulation of dry biomass development phases during the day.

According Irnazarov Sh.I. [4] the maximum dry weight accumulates in earing phase.

In field experiments, the accumulation of dry matter before the flowering stage in all sowing dates with hanging seeding rates were increased. In the flowering stage with increasing seeding rates of 5.0 million to 6.0 million viable seeds/ha. reduces the accumulation of dry matter per hectare from 105.7 to 103.3 centner. This depends mainly on the early during sowing. Strong tillering plants, thick stems and dried lower leaves of plants. Collect the maximum dry weight at all times and norms of crop plants in wax ripeness. The full ripeness of grain aboveground plant dry weight decreased.

The net productivity of durum wheat photosynthesis depends not only on the value of the carrying device and the intensity of the work leaves a duration of time.

Changes net photosynthetic productivity of plants during the growing season, at the beginning of development is gradually increased to the flowering phase is decreased net photosynthetic productivity in the flowering stage to wax ripeness.

High leaf area observed in earing phase. But it decreased the net photosynthetic productivity than the output in the receiver phase (Table 3).

Table 2 Effect of sowing time and seeding rate on the photosynthetic the potential of durum wheat (2015-2017), thousand m^2 days/ha

Dates of sowing	Seeding rates mil. viable seeds/ ha	Phases of development							by vegetation
		the spring bushing	access to the tube	earing	flowering	milk ripeness	wax ripeness	Entireli ripeness	
21.09	3,0	190.1	297.0	1180.1	207.6	351.5	393.9	-	26202
	4,0	196.0	366.3	1198.7	221.3	384.7	435.3	-	2802.3
	5,0	202.1	394.3	1303.7	235.6	387.9	482.9	-	3006.5
	6,0	208.0	416.0	1323.6	247.8	420.9	539.6	-	3155.9
11.10	3,0	178.2	429.4	1319.3	354.8	437.1	564.8	-	3283.6
	4,0	194.3	452.2	1402.3	370.1	467.0	587.9	-	3473.8
	5,0	222.2	490.2	1464.0	280.6	483.9	603.6	-	3544.5
	6,0	245.0	518.7	1512.6	291.1	505.5	628.8	-	3701.7
1.11	3,0	95.2	295.2	1011.1	207.5	305.9	348.3	-	2263.2
	4,0	104.1	360.0	1126.8	219.0	327.4	385.1	-	2522.4
	5,0	119.0	409.6	1215.2	226.2	346.6	415.0	-	2731.6
	6,0	141.3	471.6	1304.9	234.3	365.3	445.2	-	2962.6

Reduction of net productivity of photosynthesis with increasing plant density. In early sowing (21.09) at a rate of 3.0 million. viable seeds/ha net photosynthetic productivity was 5.54 g/m^2 and with the increase of planting 6.0

Table 3 Net photosynthetic productivity of durum wheat, depending on the timing and application rate (2015-2017), g /m^2 days

Dates of sowing	Seeding rates mil. viable seeds/ha	Phases of development						by vegetation
		the spring bushing	access to the tube	earing	flowering	milk ripeness	wax ripeness	
21.09	3,0	-	5.54	4.91	9.94	5.67	3.91	5.99
	4,0	-	5.28	4.96	9.03	4.16	2.43	5.17
	5,0	-	5.07	4.71	6.52	3.61	2.19	4.42
	6,0	-	5.00	4.14	4.33	2.96	2.07	3.70

11.10	3,0	-	6.27	4.25	8.45	4.13	3.40	5.30
	4,0	-	6.14	4.02	7.64	3.75	3.11	4.93
	5,0	-	5.55	3.90	7.39	3.66	3.08	4.72
	6,0	-	5.13	3.73	7.25	3.60	2.97	4.54
1.11	3,0	-	6.08	4.01	7.96	4.09	3.33	5.09
	4,0	-	5.70	3.96	7.24	3.86	3.23	4.80
	5,0	-	4.93	3.77	7.03	3.74	3.11	4.52
	6,0	-	4.89	3.43	6.24	3.49	2.80	4.17

million standards viable seeds/ha, 5.00 g/m^2. A similar pattern is observed in other terms and norms of sowing.

The net productivity of photosynthesis were observed in the phase of exit in the tube, the high was in the optimal timing of sowing than in the early and later stages of crop.

High net productivity of photosynthesis observed at the early crops in the phase of earing (3 table). Decreases net photosynthetic productivity to the detention of sowing date in all seeding rates very high net productivity of photosynthesis observed in earing phase, when sown on 21 September sowing norm of 3.0 million viable seeds/ha was 4.91 g/m^2, and the lowest at november 1 seeding seeding rate of 6.0 million viable seeds/ha, 3.43 g /m^2.

The maximum net photosynthetic productivity is observed in the flowering stage when sowing on September 21 at a rate of 3.0 million viable seeds/ha and 4.0 million viable seeds/ha, respectively, 9.94 and 9.03 g/m^2. With increasing seeding rates to 5.0 and 6.0 million. viable seeds/ha. It leads to a decrease net photosynthetic productivity. A further phase of the development of the dairy, wax ripeness net productivity of photosynthesis decreased. Net photosynthetic productivity of durum wheat during the vegatation season, depending on the terms of seeding rate ranged from 5.99 to 3.70 g /m^2.

CONCLUSIONS

Thus, on the irrigated lands in the southern region of Uzbekistan durum wheat sort "Krupinka" is formed by plating October 11 at the rate of 5.0 million viable seeds/ha grain yield was 60.4 centner per hectare, with a net productivity of photosynthesis during the vegetation season 4.72 g/m^2, a sheet surface of 4.03 m^2/m^2, 3544.5 thousand photosynthetic potential m^2/ ha days.

REFERENCES

1. Bukhoriev T.A., Tukhtaev M.O. Photometric parameters of winter wheat depending on sowing time//Agricultural science. -Moscow, 2012.-№ 10.-p. 10-11(in Russian).
2. The methodology of the field experience. Uzbekistan Scientific Research Institute of Cotton, -Toshkent, 2007. 145 p. (in Uzbek).
3. Dospexov B.A. Methods of field experience. -M., 1985. -356 p (in Russian).
4. Irnazarova SI Effect of sowing date on the growth, development and yield of major crops and crop under bright gray soils Kashkadarya region: The dissertation of a Agrocultural Sciences - Samarkand, 2002. -. 19 p(in Uzbek).
5. Irnazarova N.I. Growth, development and yield of winter wheat and millet crop sowing, depending on the norms of nitrogen fertilizers in a bright gray soils Kashkadarya region: The dissertation of a Agrocultural Sciences. - Samarkand, 2002. – 23 p (in Uzbek).
6. Keldiyarova H.H. The effect of planting dates on winter hardiness and yield of winter wheat in the Zarafshan valley: The dissertation of a Agrocultural Sciences. - Samarkand: 2004. –p 21(in Uzbek).
7. Nichiporovich A. A. The photosynthetic activity of plants in crops. Moscow., 1961. -135 p. (in Russian).
8. Oserboeva T, Azhiniyazova N.K. Influence of norms and times of crop of winter wheat at photosynthetic ally assets/ national first conference dedicated to breeding, seed production and cultivation technology Uzbekistan. - Tashkent: 2004. - p. 245-246 (in Uzbek).
9. Maxmatmurodov A,Mashrabov M. Effects of phosphor storage fertilizers on phosphate regime and cabbage yield of typical gray soils. Plant cell biotechnology and molecular biology. 2021 - Volume 22 [Issue 55-56]. EUROPE: International Knowledge Press, S107, 3 Hardman Square, Spinningfields, Manchester, M3 3EB, UK. Page**:** 33-41.
10.Rizayev Sh.X. The influence of agro-technical and chemical weeds control measures and yield of autumn wheat in Zarafshon valley of Uzbekistan. Plant Cell Biotechnology and Molecular Biology 22 (67&68): 38-46 England. 2021 ISSN: 0972-2025.
10. Botirov, A., & Arakawa, O. (2021). Root Growth Changes in the Winter Planting of Young ‘Miyabi Fuji’Apple Trees. International Journal of Horticultural Science and Technology, 8(3), 227-233.
11. Botirov, A., An, S., Arakawa, O. and Zhang, S. (2022). Application of a Visible/Near-infrared Spectrometer in Identifying Flower and Non-flower Buds on ‘Fuji’ Apple Trees. Indian Journal of Agricultural Research. 56(2): 214-219.