

VEGETATION PERIOD, FORMATION OF YIELD COMPONENTS, AND YIELD INDICATORS OF SPRING WHEAT VARIETIES

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Annotation: this paper highlights, connection between formation of growing elements and peculiarities harvest as a result, this showed quality of crop

Key words: wheat, date, growing, sort, vegetation, phase, correlation, harvest.

Аннотация: В статье дано взаимности формирование элементов роста и показатели урожайности и в результаты этого взаимности является основой показателем технологическиво качества зерна.

Ключевые слова: яровая пшеница, срок, орошение, удобрение, сорт, вегетация, фаза, корреляция, урожайность.

Material and methodology. The object of the research was 20 varieties of spring soft wheat of various ecological origins. According to the State Variety Testing Commission, the standard variety for spring soft wheat is Hazrati Bashir.

In the conducted field experiments, the studied spring wheat varieties were sown on February 20 using a special seeder, and irrigation was carried out the following day. Fertilization was performed on March 1 using ammonium fertilizers at a rate of 200 kg/ha. Nitrogen topdressing was applied on April 8 using ammonium nitrate at a rate of 150 kg/ha, followed by irrigation on April 7–8.

The length of the vegetation period of plants depends on the natural environmental factors. On the sown plots, the average wheat maturation date in spring is June 25, varying between June 18 and July 5. Spring wheat matures 5–7 days later than winter wheat. The vegetation period of spring wheat averages 98 days, ranging from 62 to 125 days (Lavronov, 1969).

As a result of studying around 20 different varieties of spring soft wheat, an organic correlation was found between the grain ripening period and the weight of 1000 grains. As shown in the experiment by Heine et al. (1987), early-maturing varieties are more productive under hot climate conditions. Research conducted by Galderini D. and Dreecer M. (1995) also showed a positive correlation between the number of ears and yield in early-maturing varieties.

The germination phase of wheat is important for yield because it is during this phase that the activity of the embryonic root system declines and the main root system begins to form. For wheat grains to germinate, they must accumulate 50% moisture. If the soil temperature is 5°C, the seedlings may emerge in 20 days; at 10°C to 15°C, emergence occurs in 7–9 days (Vavilov N.I., 1964).

In all regions and at all sowing times where the experiment was conducted, seedling emergence was uniform and synchronized. It was observed that the interval between sowing and germination for spring wheat varieties in spring varied by 1–2 days depending on the average daily temperature.

Research results. In our study, we focused on the duration of the "germination" period of spring wheat varieties.

Table 1
Vegetation period of spring wheat varieties sown early

№	Variety name	Period before earing day	Growing season, day
1	САНЗАР-4	83,5	115,0
2	ҲАЗРАТИ БЕШИР	82,5	113,0
3	ЖАНУБ ГАВҲАРИ	83,3	117,7
4	Кр-Сп/2010/59	80,5	113,0
5	АТТИЛЛА-7	84,7	117,7
6	Кр-СпР2014-2	83,0	115,5
7	Кр-СпР2014-3	84,0	115,5
8	Кр-СпР2014-4	84,0	117,0
9	Кр-СпР2014-6	82,5	114,8
10	КрТ-СпР2015	84,5	115,5
11	Кр-СпР2014-8	82,5	114,0
12	Кр-СпР2014-9	83,5	114,5
13	Кр-СпР2014-10	85,0	116,0
14	Кр-СпР2014-13	84,5	114,0
15	КрЖ-СпР2015	84,7	118,0
16	Кр-СпР2014-15	83,5	114,5
17	Кр-СпР2014-19	84,5	116,3
18	Кр-СпР2014-20	84,0	117,3
19	Кр-СпР2014-21	83,7	117,3
20	Кр-СпР2014-22	84,0	117,7

When spring soft wheat varieties were sown at early dates, the period until heading ranged from 80.5 to 85 days. According to studies on varieties sown in early spring, the shortest heading period was recorded as 80.5 days for line Kr-Sp / 2010/59, 82.5 days for lines Kr-SpR2014-8 and Kr-SpR2014-6, and 83 days for line Kr-SpR2014-2. These figures show that the heading period for these lines was 2–3 days shorter than that of the standard spring soft wheat variety Sanzar-4.

The “emergence-to-maturity” period for spring soft wheat sown in early spring ranged from 30 to 34 days. In our research, the shortest maturation periods — 31–32 days — were observed in the varieties and lines Hazrati Beshir, Kr-Sp / 2010/59, Kr-SpR2014-13, Kr-SpR2014-8, Kr-SpR2014-9, Kr-SpR2014-15, and Kr-SpR2014-6 to -10, which was shorter than that of the standard variety Sanzar-4.

The total vegetation period for the studied spring wheat varieties ranged from 101 to 106 days. The varieties Hazrati Beshir, Kr-SpR2014-6, Kr-SpR2014-8, Kr-SpR2014-4, Kr-SpR2014-9, Kr-SpR2014-15, and Kr-SpR2014-21 were identified as the earliest-maturing and were selected for further development.

Table 2
Productive tillering of spring wheat varieties and plant height

№	Variety name	Number of total stems, pcs	Number of productive stems, pcs	Productivity coefficient, %	Plant height, cm
1	SANZAR-4	1,27	1,17	92,11	59,36
2	HAZRATI BESHIR	1,67	1,30	78,00	67,67
3	JANUB GAVHARI	1,63	1,47	89,80	77,70
4	Kr-Sp/2010/59	1,47	1,30	88,64	61,81
5	ATTILLA-7	1,60	1,50	93,75	64,44
6	Kr-SpR2014-2	1,70	1,27	74,51	64,16
7	Kr-SpR2014-3	1,43	1,30	90,70	64,63
8	Kr-SpR2014-4	1,43	1,30	90,70	70,39
9	Kr-SpR2014-6	1,60	1,33	83,33	72,30
10	KrT-SpR2015	1,37	1,27	92,68	61,29
11	Kr-SpR2014-8	1,67	1,23	74,00	65,53
12	Kr-SpR2014-9	1,33	1,23	92,50	60,87
13	Kr-SpR2014-10	1,37	1,13	82,93	64,66
14	Kr-SpR2014-13	1,50	1,20	80,00	72,62
15	KrJ-SpR2015	1,47	1,43	97,73	68,37
16	Kr-SpR2014-15	1,43	1,27	88,37	63,91
17	Kr-SpR2014-19	1,50	1,23	82,22	74,28
18	Kr-SpR2014-20	1,60	1,47	91,67	69,08
19	Kr-SpR2014-21	1,60	1,53	95,83	67,43
20	Kr-SpR2014-22	1,60	1,53	95,83	71,53

Experimental data show that the height of spring wheat varieties ranges from 59.36 to 77.7 cm, while the standard variety Sanzar-4 has a height of 59.36 cm. According to Beltyukova L.P. (2002), wheat yield is determined by such indicators as the number of productive stems, the number of grains per spike, and the weight of 1000 grains. In most cases, the productivity of an individual plant is what determines the overall yield of the variety.

Table 3
Crop elements and yield of spring varieties

№	Variety name	Spike length, cm	Number of spikelets, pcs	Number of grains, pcs	Spike weight, g	Grain weight, g	Yield, c/ha
1	SANZAR-4	6,9	11,7	36,7	2,0	1,3	29,71±0,6
2	HAZRATI BESHIR	7,6	14,8	43,7	2,4	1,4	37,76±3,1
3	JANUB GAVHARI	8,8	18,5	49,0	2,5	1,6	47,60±5,2
4	Kr-Sp/2010/59	7,7	11,9	34,7	1,8	1,2	31,90±6,4
5	ATTILLA-7	7,5	18,9	55,0	2,8	1,8	48,43±0,6
6	Kr-SpR2014-2	7,6	13,0	40,1	2,0	1,4	34,76±5,5
7	Kr-SpR2014-3	7,5	11,7	35,1	1,9	1,3	30,75±1,3

8	Kr-SpR2014-4	8,0	16,3	48,4	2,6	1,5	42,56±4,0
9	Kr-SpR2014-6	8,2	15,3	46,1	2,6	1,4	39,44±0,9
10	KrT-SpR2015	7,1	12,3	36,8	1,9	1,2	32,54±1,5
11	Kr-SpR2014-8	8,1	13,9	41,3	2,1	1,4	36,22±9,3
12	Kr-SpR2014-9	7,0	11,6	32,9	1,8	1,2	30,58±5,6
13	Kr-SpR2014-10	7,6	11,3	32,7	1,8	1,1	29,20±0,5
14	Kr-SpR2014-13	8,3	13,7	42,2	2,1	1,4	36,02±4,0
15	KrJ-SpR2015	8,0	17,8	48,7	2,6	1,7	48,29±0,8
16	Kr-SpR2014-15	7,9	13,1	40,4	2,1	1,4	33,87±3,1
17	Kr-SpR2014-19	8,3	15,4	41,6	2,3	1,2	40,87±1,7
18	Kr-SpR2014-20	8,1	17,4	48,9	2,6	1,7	45,55±1,9
19	Kr-SpR2014-21	7,6	17,9	50,1	2,5	1,6	45,99±10,1
20	Kr-SpR2014-22	8,1	17,9	46,7	2,4	1,6	47,46±2,0

According to the count of grains per spike, the standard variety Sanzar-4 had an average of 36.7 grains per spike. In comparison, the “Janub Gavhari” variety had 49.0 grains, “Hazrati Beshir” had 43.7 grains, “Attila-7” had 55.0 grains, Kr-SpR2014-21 had 50.1 grains, Kr-SpR2014-20 had 48.9, Kr-SpR2015 had 48.7, Kr-SpR2014-4 had 48.4, Kr-SpR2014-22 had 46.7, and Kr-SpR2014 had 46.1 grains per spike.

Regarding the grain weight per spike, the standard variety Sanzar-4 yielded 1.3 g. In comparison, “Janub Gavhari” yielded 1.6 g, “Hazrati Beshir” 1.4 g, “Attila-7” 1.8 g, KrJ-SpR2015 1.7 g, Kr-SpR2014-20 1.7 g, Kr-SpR2014-22 1.6 g, Kr-SpR2014-21 1.6 g, and Kr-SpR2014-4 yielded 1.5 g per spike.

Conclusions:

1. When cultivating spring wheat, the average maturation date is June 25, with a range from June 18 to July 5. Spring wheat matures 5–7 days later than winter wheat. The vegetation period of spring wheat averages 98 days, varying between 62 and 125 days.
2. The plant height of spring wheat varieties ranged from 103.2 to 124.4 cm, while the standard variety Sanzar-4 measured 106.3 cm.
3. When spring wheat was sown at later dates, the number of total stems in the standard variety Sanzar-4 was 1.4 per plant, with a productivity coefficient of 95.3%. The highest number of total stems — 1.5 per plant — was observed in the samples Kr-SpR2014-19, Kr-SpR2014-21, and Kr-SpR2014-22. Meanwhile, the highest productivity level of 100% was recorded in the samples Kr-SpR2014-21, Kr-SpR2014-20, and Kr-SpR2014-4.
4. According to the results of early sowing, the highest yield levels — ranging from 40.87 to 48.43 centners per hectare — were recorded in the experimental samples Attila-7, KrJ-SpR2015, South Pearl, Kr-SpR2014-22, Kr-SpR2014-21, Kr-SpR2014-20, Kr-SpR2014-4, and Kr-SpR2014-19. In particular, consistently high yields were observed in KrJ-SpR2015, South Pearl, Kr-SpR2014-22, Kr-SpR2014-21, Kr-SpR2014-20, and Kr-SpR2014-4.
5. In the course of analyzing the technological quality of grain, it was found that the gluten content in the standard variety Sanzar-4 increased depending on sowing time: reaching 29.1% when sown in the autumn, 30.1% in early spring, and 31.5% in late spring.

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