

INFLUENCE OF VARIETY CHARACTERISTICS AND FERTILIZER ON WINTER WHEAT PRODUCTIVITY

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The level of forming winter wheat productivity of varieties Dykanka, Selyanka, Kryzhynka with the variants of experiment: without fertilizers (control); N30P60K60; N60P60K60 in the production conditions of Poltava region has been investigated. Variety Selyanka with the dose of fertilizers N60P60K60 has been singled out according to investigated characteristic. Variety Selyanka is recommended to grow in Poltava region with the purpose of obtaining high and stable yields.

Increase of productivity is the main direction in winter wheat selection for today. Productive potential of variety is always used as the most important characteristic that is why investigation of productivity elements according to their influence on the productivity has been conducted for a long time. Breeding of wheat varieties with the highest possible productivity level is the ultimate purpose of every selectionist, as increase of productivity is one of the most difficult and complex tasks [4].

The importance of variety resources in the intensification of agriculture increases constantly. Among biological facilities of agriculture acceleration such as rational structure of sowing and optimum crop alternation in crop rotation, fertilizers application, management of soil reaction, integrated plant protection, quality of sowing material, variety is very important. Every modern technology has variety in its basis. Without knowledge of variety peculiarities it is impossible to control dynamic process of yield formation which needs understanding of all development regularities, from seed germination to complete grain ripeness.

Only on the base of variety it is possible to solve several problems, related to improvement of crop growing technology and increasing productivity [1, 5]. Fertilizers also are one of the effective and fast-acting factors of increasing winter wheat productivity. Great positive influence of fertilizers on wheat productivity is explained by the fact that soil contains nutrients in hard soluble form and physiological activity of root system it not enough high. Application of fertilizers under wheat provides high enough increases of harvest on all soil groups [1, 3].

So, study of winter wheat productivity depending on variety characteristics and system of fertilizers is very important for today.

Researches methods. The purpose of researches was establishing influence of variety characteristics and fertilizers on forming winter wheat productivity in production conditions of Poltava region. Material for researches was three varieties of soft winter wheat of different geographical origin: Dykanka, Selyanka, Kryzhynka with the variants of experiment: without fertilizers (control); N₃₀P₆₀K₆₀;

$N_{60}P_{60}K_{60}$. In the production conditions of farm «Atlanta» Kremenchuk district level of forming winter wheat productivity was studied during 2012-2013.

Sowing of winter wheat was conducted in the terms (first and second ten-day periods of September) recommended for the area with seed of the first reproduction on depth of 3-5 cm by sowing machine SZ-3,6. The rate of sowing was 4,5 million seeds/ha.

The account of productivity was carried out according to the generally accepted methods. All factors in the experiment are maximally similar: experiment is made on one field with the leveled relief, soils with equal NPK content, predecessor during research years was pea.

The statistical processing of data of productivity was conducted according to the program of variance analysis using computer program „Statistica 6,0” and according to the methods of B. A. Dospekhov [2].

Research results. According to the research results it has been established that variety together with agrotechnical measures and weather conditions plays an important role in forming winter wheat productivity.

So, productivity of winter wheat varieties in 2012 year depending on the doses of fertilizer varied in such way: Dykanka – 3,45-3,72 t/ha; Kryzhynka – 3,98-4,23 t/ha; Selyanka – 4,05-4,42 t/ha (table. 1).

1. Winter wheat productivity 2012, t/ha

Variety(factor A)	Variant of fertilizer (factor B)	Repetition				average
		I	II	III	IV	
Dykanka	Without fertilizers (control)	3,78	3,25	3,41	3,36	3,45
	$N_{30}P_{60}K_{60}$	3,81	3,42	3,67	3,54	3,61
	$N_{60}P_{60}K_{60}$	3,91	3,58	3,67	3,72	3,72
Kryzhynka	Without fertilizers (control)	4,09	3,77	3,93	4,13	3,98
	$N_{30}P_{60}K_{60}$	4,23	3,92	4,01	4,12	4,07
	$N_{60}P_{60}K_{60}$	4,41	4,07	4,27	4,17	4,23
Selyanka	Without fertilizers (control)	4,20	3,91	4,02	4,07	4,05
	$N_{30}P_{60}K_{60}$	4,51	4,17	4,38	4,30	4,34
	$N_{60}P_{60}K_{60}$	4,61	4,27	4,45	4,35	4,42
Average in the experiment = 3,99						
HIP ₀₅ factor A = 0,16						
HIP ₀₅ factor B = 0,28						
HIP ₀₅ factor AB = 0,23						

According to variety characteristics (factor A) on the variant without fertilizers Kryzhynka and Selyanka substantially exceeded variety Dykanka after the productivity (3,45 t/ha), but between varieties Kryzhynka and Selyanka according to this characteristic there was not substantial difference (4,05 and 3,98 t/ha accordingly). With the variant of fertilizer of N30P60K60 between the varieties of winter wheat there was a substantial difference according to the productivity: Kryzhynka and Selyanka substantially exceeded variety Dykanka (3,61 t/ha), and variety Selyanka exceeded variety Kryzhynka (4,34 and 4,07 t/ha accordingly).

With the variant of N60P60K60 there was an analogical situation: Kryzhynka and Selyanka substantially exceeded variety Dykanka (3,72 t/ha), and variety Selyanka exceeded variety Kryzhynka (4,42 and 4,23 t/ha accordingly).

With the doses of application (factor B) substantial difference was not observed between the variants of fertilizer (HIP05 = 0,28 t/ha) of the varieties Dykanka and Kryzhynka. Variety Selyanka was substantially less variant without fertilizers (4,05 t/ha) according to productivity than variants of fertilizer of N30P60K60 and N60P60K60 and there was not substantial difference between them (4,34 and 4,42 t/ha accordingly).

Winter wheat productivity in 2013 was greater: variety Dykanka – 4,86-5,13 t/ha; variety Kryzhynka – 5,44-5,69 t/ha; variety Selyanka – 5,78-6,17 t/ha (table 2).

2. Winter wheat productivity 2013, t/ha

Variety(factor A)	Variant of fertilizer (factor B)	Repetition				average
		I	II	III	IV	
Dykanka	Without fertilizers (control)	5,01	4,67	4,81	4,95	4,86
	N ₃₀ P ₆₀ K ₆₀	5,13	4,79	4,93	5,03	4,97
	N ₆₀ P ₆₀ K ₆₀	5,27	4,98	5,15	5,12	5,13
Kryzhynka	Without fertilizers (control)	5,67	5,21	5,49	5,39	5,44
	N ₃₀ P ₆₀ K ₆₀	5,71	5,31	5,53	5,69	5,56
	N ₆₀ P ₆₀ K ₆₀	5,88	5,49	5,61	5,78	5,69
Selyanka	Without fertilizers (control))	5,91	5,62	5,74	5,85	5,78
	N ₃₀ P ₆₀ K ₆₀	6,07	5,79	5,87	5,95	5,92
	N ₆₀ P ₆₀ K ₆₀	6,23	6,08	6,15	6,22	6,17
Average in the experiment = 5,50						
HIP ₀₅ factor A = 0,16						
HIP ₀₅ factor B = 0,36						
HIP ₀₅ factor AB = 0,21						

In 2013 according to variety characteristics (factor A) on the variant without fertilizers Kryzhynka and Selyanka substantially exceeded variety Dykanka (4,86 t/ha) according to productivity and variety Selyanka (5,78 t/ga) according to this characteristic was substantially higher than variety Kryzhynka (5,44 t/ha). With the variant of fertilizer of N30P60K60 there was an analogical situation – between the winter wheat varieties according to productivity there was substantial difference: Kryzhynka and Selyanka substantially exceeded variety Dykanka (4,97 t/ha) and variety Selyanka exceeded variety Kryzhynka(5,92 and 5,56 t/ha accordingly). With the variant of N60P60K60 also Kryzhynka and Selyanka substantially exceeded variety Dykanka (5,13 t/ha), and variety Selyanka exceeded variety Kryzhynka (6,17 and 5,69 t/ha accordingly).

With the doses of application (factor B) substantial difference was not observed between the variants of fertilizer (HIP05 =0,36 t/ha)of the varieties Dykanka and Kryzhynka. Variants of variety Selyanka without fertilizers and N30P60K60 had no substantial difference according to productivity, but the variant of fertilizer of N60P60K60 substantially exceeded control without fertilizers(5,78t/ha) according to this characteristic.

Conclusions:

According to the results of the conducted researches studying winter wheat productivity depending on variety and fertilizer during 2012-2013 years in the production conditions the followings conclusions have been done:

1. According to productivity it is possible to select variety Selyanka with the dose of fertilizers of N60P60K60, which was 4,42 and 6,17 t/ha.
2. This variety Selyanka with the variant of fertilizer of N60P60K60 is recommended to grow in Poltava region with the purpose of obtaining high and stable yields of winter-wheat.

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