UDC631.1: 631.527: 631.51: 63 DOI: 10.30835/2413-7510.2022.261005

MAJOR ASPECTS OF INTERREGIONAL TRANSFER OF BREEDING/SEED INNOVATIONS WITH EXPORT POTENTIAL

Yehorov D.K., Yehorova N.Yu., Ulianchenko O.V., Kapustian M.V., Kravchenko I.O., Tokar I.V., Sarapin H.P, Bordun M.D.

Plant Production Institute named after V.Ya. Yuriev of NAAS, Ukraine

The results of studies conducted by researchers of the Plant Production Institute named after V.Ya. Yuriev of NAAS prove the importance of development and timely transfer of breeding/plant innovations with export potential, which are adapted both to climatic and to modern market conditions in interregional agribusiness.

***Key words**: breeding/plant innovations with export potential, transfer, seed industry, grain production, interregional market relations*

Introduction. Analysis and justification of major aspects of the strategy of further fruitful cooperation of scientists with producers of grain and oil, especially in Eastern Ukraine, is of informational value for agrarian producers.

Timely implementation of breeding innovations (more adapted varieties, hybrids and parental components bred at the Institute) and modern technologies in the grain production of the Eastern region of this country promotes growth in the croppage of grain with improved sowing qualities and increases profitability of producers of different forms of ownership at the interregional level.

Literature review and problem articulation. Basing on the results and scientific materials of many scientists-agrians (O.M. Shpychak, Yu.Ya. Hapusenko, S.A. Stasinevych, A.V. Rozhon, Yu.P. Voyskobiynyk, R.Ya. Demchenko and others), we highlighted a number of relevant problems in the current grain business of this country. The problem of insufficient state support for domestic producers, which leads to their gradual unprofitableness and increases the price disparity, is the most important one [1–7].

That is, the state regulation of grain prices through mortgages and interventions does not exert the proper impact due to the lack of financial and commodity resources.

In this regard, the use of innovative resource-saving technologies for growing crops and breeding innovations with the greatest genetic and export potentials as well as technical reequipment of agriculture, with due account for its complex nature, contributing to the economical use of resources, increasing labor productivity, reducing costs of grain production, and boosting sales, is the most urgent objective.

As of November 11, 2021, according to the Department of Agribusiness of the Kharkiv Regional Administration, the region's farms harvested cereals and legumes from 1,000,000 hectares or from 98% of the total harvest area. The average yield exceeded the last year's figures and amounted to 46.6 cwt/ha, which is by 4.4 cwt/ha more.

In terms of gross production of cereals, the Kharkivska Oblast ranks 3rd among the oblasts of Ukraine. They threshed 7,000 tons of buckwheat (yield 12.1 cwt/ha), 19,700 tons of millet (yield – 22.9 cwt/ha), 1,261,400 tons of grain corn (yield 47.3 cwt/ha). 1,300,000 tons of sunflower was harvested (the second highest in Ukraine; yield 22.8 cwt/ha); 36,700 tons of soybean was harvested (yield 16.2 cwt/ha) [8–13].

Purpose. To investigate and rationalize the major aspects of interregional transfer of breeding/plant innovations with export potential, of synergistic interaction between science, edu-

ISSN 1026-9959. Селекція і насінництво. 2022. Випуск 121.

cation and commodity production for more rapid innovative development of the country's regions.

Material and methods. To solve the set objectives, we used the following research methods: dialectical, abstract-logical, monographic, computational-constructive, economic-statistical, graphic modeling and others. The research was also based on the provisions of the Laws of Ukraine "On Investment Activity", "On the State Regulation of Activities in Technology Transfer"; regulations and guidelines on market relations in the agricultural sector and seed industry; statistical data of the State Statistics Service of Ukraine; information from the Ministry of Economic Development, Trade and Agriculture of Ukraine and from the State Fiscal Service of Ukraine; live data of the Department of Agribusiness of the Kharkiv Regional Administration, of marketing service of the Institute; accounting reports of basic farms of the Institute; publications and scientific achievements of Ukrainian and foreign scientists-agrarians, etc.

Results and discussion. The current organizational layout of production and sale of spiked cereal seeds in the country provides for the transfer of primary seeds from breeders-originators of research institutions (RI) mainly to experimental farms of NAAS for growing elite seeds. These farms sell such seeds to agricultural enterprises that are permitted to grow certified seeds, and certified seeds are sold to producers of cash grain.

Therefore, breeders' efforts are aimed at creating varieties with increased resistance to drought, frost, diseases, and pests. Here, it is necessary to determine the most feasible technologies for growing cereals to completely fulfill the genetic potential of varieties and hybrids. The creation of breeding/plant innovations with export potential (varieties, hybrids and parental components) at the NAAS RI is related to analyses of the above data, and, therefore, contributes to the gradual improvement of oil and grain industries in the Eastern and other regions of Ukraine.

To emphasize the importance of timely transfer of more adapted varieties, hybrids and parental components bred at the Institute to the production, we analyzed the numbers of the Institute's crop accessions in the State Register of Plant Varieties Suitable for Dissemination in Ukraine in 2021 (Table 1).

Table 1

The accession numbers in the State Register of Plant Varieties Suitable for Dissemination in Ukraine, 2019–2021

Crop	Number					2021 related to 2017, +/-
	2017	2018	2019	2020	2021	
Bread wheat (winter)	20	22	20	22	21	1
Durum wheat (winter)	2	2	2	2	2	0
Bread wheat (spring)	3	2	2	2	2	1
Durum wheat (spring)	6	6	6	6	8	2
Emmer	2	2	1	2	2	0
Rye (winter)	6	7	6	7	8	2
Rye (spring)	6	7	7	7	7	1
Triticale (winter)	11	14	16	14	19	8
Triticale (spring)	12	10	11	10	11	-1
Barley (spring)	13	11	15	11	13	0
Corn	39	41	39	41	43	4
Corn (parental components)	59	58	45	58	46	-13
Garden pea	9	7	7	7	7	-2
Millet	8	9	10	9	10	2
Sunflower	55	41	41	41	46	-9
Sunflower (parental components)	50	59	44	59	41	-9
Soybean	13	12	14	12	13	0
Total:	**314**	**308**	**286**	**310**	**299**	**-15**

Table 1 indicates that in 2021, compared to 2017, the number of the major crop accessions bred by the Institute decreased by 15. During these years, a large number of breeding innovations were in grain producers' demand, as innovative varieties and hybrids are more adapted to the current climate and more competitive in the market of varieties bred by other institutions.

That is, there is no urgent need to create as many new varieties as possible; the implementation of newly created breeding innovations into production is gradual, taking into account grain producers' wishes and changes in the market.

Thus, the numbers of sunflower and corn accessions decreased by 9, which is also influenced by a significant increase in the numbers of foreign varieties and hybrids. The number of winter triticale accessions increased by 8, as the demand for this crop has grown rapidly recently (Tables 2, 3).

Table 2

Sales of seeds of first generations of winter crops bred at the Plant Production Institute named after V.Ya. Yuriev of NAAS, by oblasts, 2017–2021

Oblast	2021 related to 2017, +/-		
	Consumer number	Sold seeds, tons	Oblast's share in the total sum, %
Winter bread wheat			
Kharkivska	2	-57.9	-8,9
Sumska	-1	-3.2	-0,3
Poltavska	-1	-1.0	0,4
Dnipropetrovska	1	14.1	12,5
Luhanska	3	0.6	4,6
Chernihivska	-3	-9.3	-7,3
Mykolaivska	-1	-4.0	-1,8
Donetska	2	-9.3	-1,6
Odeska	-1	-2.0	-0,9
Kyivska	0	-5.8	-2,4
Zaparizka	3	5.0	4,8
Cherkaska	1	0.2	0,2
Kirovohradska	1	0.7	0,7
Total:	**6**	**-71.9**	**x**
Winter rye			
Kharkivska	0	1.8	12,5
Sumska	-2	-0.7	-0,9
Poltavska	-2	-27.9	-30,8
Dnipropetrovska	1	3.6	19,3
Luhanska	0	-9.5	-7,1
Cherkaska	-1	-2.5	-2,2
Mykolaivska	-1	-3.0	-2,9
Donetska	-4	-28.0	-28,7
Kyivska	0	1.4	6,9
Zhytomyrska	-2	-11.7	-7,1
Volynska	0	2.2	10,8
Zaporizka	1	1.0	3,5
Ivano-Frankivska	1	0.3	1,1
Chernihivska	1	7.5	26,0
Rivnenska	-1	-0.4	-0,4
Total:	**-9**	**-65.9**	**x**
Winter triticale			

Kharkivska	3	2.3	-12,0
Sumska	-2	-4.0	-8,6
Poltavska	0	-1.5	-5,4
Dnipropetrovska	0	5.1	3,8
Zaporizka	0	0.4	0,7
Odeska	0	1.0	0,6
Kyivska	1	1.6	2,3
Rivnenska	-1	-0.8	-1,7
Chernivetska	-2	-2.5	-5,4
Donetska	1	1.0	1,7
Kirovohradska	2	13.6	19,2
Volynska	1	3.0	4,3
Zhytomyrska	1	0.3	0,5
Total:	**4**	**19.5**	**x**

It is clear that the Institute's scientists timely focus on the current market status, as they create and implement competitive breeding innovations that improve the oil and grain industries in the Eastern and other regions of Ukraine, enabling farmers to get better yields with better sowing parameters.

Table 2 confirms that the demand for winter wheat varieties is growing, because in 2021, compared to 2017, the number of consumers increased by 6 agrarian enterprises. In 2017–2021, varieties of this crop are bought by producers in 13 oblasts of Ukraine. Despite the fact that the amount of sold seeds decreased by almost 72 tons, agrarian enterprises of the Kharkivska, Dnipropetrovska, Donetska, Luhanska, and Zaporizka Oblasts remain more stable consumers.

The number of consumers and sales of winter rye varieties and hybrids decreased significantly: by 9 consumers and 66 tons, respectively. Consumers of this crop are widely represented in 17 oblasts of the country, but producers in the Kharkivska, Dnipropetrovska, Kyivska, Volynska, and Chernihivska Oblasts are the most stable and interested in buying seeds of this crop.

The demand for winter triticale is growing rapidly; purchases have increased by almost 20 tons, and the number of consumers - by 4 farmers. Consumers are represented in 13 oblasts of the country. The main consumers of seeds are producers of the Kharkivska, Dnipropetrovska, Kirovohradska, and Kyivska Oblasts.

Table 3 shows the sales of seeds of first generations of the major spring cereals, legumes and groats crops bred at the Plant Production Institute named after V.Ya. Yuriev.

Table 3

Sales of seeds of first generations of the major spring cereals, legumes and groats crops bred at the Plant Production Institute named after V.Ya. Yuriev, by oblasts

Oblast	2021 related to 2017, +/-		
	Consumer number	Sold seeds, tons	Oblast's share in the total sum, %
Spring wheat			
Kharkivska	1	4.3	26.4
Poltavska	0	1.2	13.5
Dnipropetrovska	-1	-1.0	-0.3
Kirovohradska	-1	-1.8	4.3
Zaporizka	0	0.0	0.0
Donetska	0	2.4	48.5
Kyivska	0	-2.5	2.7
Khersonska	-6	-14.1	-98.9

Ivano-Frankivska	1	0.1	0.3
Total:	**-5**	**-11.3**	**x**
Spring barley			
Kharkivska	4	16.4	-32.1
Poltavska	1	15.2	9.5
Dnipropetrovska	1	11.7	6.8
Luhanska	3	10.4	7.1
Kirovohradska	1	4.0	2.7
Donetska	0	-5.5	-0.4
Cherkaska	2	2.1	3.6
Kyivska	1	1.5	1.8
Vinnytska	1	0.4	0.2
Zhytomyrska	1	1.0	0.7
Total:	**-9**	**57.2**	**x**
Millet			
Kharkivska	3	0.7	-14.9
Poltavska	2	3.2	14.9
Dnipropetrovska	0	-0.6	-7.5
Vinnytska	1	1.7	7.9
Zaporizka	0	-1.5	-12.9
Donetska	-1	-0.2	-13.0
Cherkaska	1	0.5	3.3
Kyivska	1	3.0	13.7
Zhytomyrska	1	0.2	1.1
Odeska	1	0.4	1.8
Luhanska	2	1.1	5.6
Total:	**11**	**8.5**	**x**
Pea			
Kharkivska	-7	-16.9	-13.6
Sumska	2	30.0	14.7
Poltavska	2	5.8	2.1
Dnipropetrovska	2	15.0	2.7
Vinnytska	-2	-3.5	-3.0
Kirovohradska	-4	-33.1	-15.1
Zaporizka	3	34.9	17.0
Donetska	-1	-16.6	-3.3
Mykolaivska	-2	-5.3	-3.7
Kyivska	0	-1.5	-1.3
Chernihivska	1	0.1	0.1
Khersonska	2	3.4	1.8
Odeska	1	2.1	1.1
Zhytomyrska	1	1.0	0.5
Total:	**-2**	**15.4**	**x**

We see that there is a significant reduction in demand for spring wheat, as the number of consumers and sales decreased by 5 enterprises and 11.3 tons, respectively. Stable consumers of seeds are producers of the Donetska (48.5%), Kharkivska (26.4%), and Poltavska (13.5%) Oblasts.

Spring barley varieties are of interest to buyers in 10 oblasts of Ukraine. Although their number decreased by 9 consumers, the amount of sold seeds increased by 57.2 tons. That is, the market has increased the number of large agricultural enterprises (LLC, JLLC, holdings, PJSC, etc.), which buy seeds in large amounts and are monopolists in the market of the country. Demand for millet varieties has grown significantly. We see that the seed purchases in-

creased by almost 9 tons, and the number of consumers by 11 enterprises, which are represented in 11 oblasts of the country. The main consumers of seeds of this crop are producers of the Poltavska, Kyivska, Kharkivska, and Luhanska Oblasts.

Pea varieties are in demand in 14 oblasts of Ukraine. Although their number did not decrease significantly, the sales of seeds of this crop increased by 15.4 tons during the reporting period. That is, the market has increased the number of large agricultural enterprises (LLC, JLLC, holdings, PJSC, etc.), which buy seeds in large batches and are monopolists in the grain industry.

We investigated some ways of optimization and components of the introduction of breeding/plant innovations in grain production. For reference and further improvement of the computer database of varieties, hybrids and parental components bred at the Plant Production Institute named after V.Ya. Yuriev of NAAS, it is important to routinely analyze and study the above data, which will gradually improve the oil and grain industries of the Eastern and other regions of Ukraine (Table 4).

Table 4

The share of oblasts in the total sum from the sale of winter wheat, spring barley, spring pea and millet seeds, %

Oblast	Consumer share							
	winter wheat		spring barley		spring pea		millet	
	2017	2021	2017	2021	2017	2021	2017	2021
Kharkivska	69.7	60.8	79.0	47.0	29.0	16.0	55.6	40.7
Sumska	4.1	4.4	0	0	0	15.0	–	–
Poltavska	2.1	1.8	11.0	21.0	2.0	40	1.4	16.3
Dnipropetrovska	4.0	14.6	1.0	8.0	9.0	12.0	15.6	8.1
Luhanska	7.3	8.6	0	7.0	–	–	0	5.6
Chernihivska	0	1.8	–	–	1.0	1.0	-	-
Mykolaivska	0	5.7	–	–	11.0	7.0	–	–
Donetska	4.1	0.9	9.0	9.0	8.0	5.0	13.0	0
Odeska	0	2.7	–	–	0	1.0	0	1.8
Kyivska	0.3	0	0	2.0	2.0	1.0	0	13.7
Zaporizka	0	4.8	0	0	19.0	36.0	14.4	1.5
Cherkaska	0	0.2	–	–	–	–	0	3.3
Kirovohradska	0.7	0.7	0	3.0	16.0	1.0	0	0
Zhytomyrska	–	–	0	1.0	0	1.0	0	1.1
Vinnytska	–	–	–	–	3.0	0	0	7.9
Khersonska	–	–	–	–	0	2.0	–	–

As we can see, the regular consumers of seeds of the major agricultural crops are mainly producers of grain and oil in the Eastern region of Ukraine, viz. Kharkivska Oblast – up to 70%, Dnipropetrovska Oblast – 15%, Luhanska Oblast – 10%, Donetska Oblast – 6%, Sumska Oblast – 5%, Poltavska Oblast – 2% and others.

Data from the State Statistics Service of Ukraine show that for 10 months of 2021 the manufacture of plat products by Ukrainian agrarian enterprises and farms increased by 18%. During this time, total agricultural production increased by 13% compared to 2020. Thus, for 10 months of 2021, agricultural enterprises increased production by 17.2%, and households – by 6.3% [14]. In addition, the plant production by all subjects of agribusiness increased by 18%, while the livestock production decreased by 4.2% compared to the January–October period of 2020.

According to the preliminary estimate of the Ukroliiaprom Association, in 2021/22 MY the production of major oilseeds will reach 22,300,000 tons vs. 18,460,000 tons in 2020/21 MY (+ 121%). In particular, the production of sunflower seeds is predicted to be 16,000,000 tons (+ 122%), of rapeseed – 3,000,000 tons (+ 107%), of soybean – 3,300,000 tons (+ 129

%). According to the State Statistics Service as of November 1, 2021, compared to the corresponding period of 2020, the whole stocks of sunflower seeds in Ukraine increased by 1,518,500 tons (at growing enterprises, they increased by 1,238,000 tons; at processing and storing enterprises, they decreased by 20,000 tons).

The rapeseed stocks decreased by 200,700 tons (at growing enterprises, they decreased by 179,300 tons; at processing and storing enterprises, they increased by 1,100 tons). Almost 80% of this raw material was exported in July-October 2021/22; 13.3% was processed.

In September–October 2021/22 MY, compared to the corresponding period 2020/21 MY, there is a decrease in the sunflower oil production by 13.5%, which is attributed to restrained sales of sunflower seeds by farmers anticipating a rise in prices for this raw material. This is confirmed by a significant increase in sunflower producers' stocks and by a decrease in sunflower oil exports by 14.2% during this period. At the same time, the sunflower oil stocks only at enterprises exceeded 138,000 tons (over 34% of domestic annual use). The price situation in the domestic market is stable, the trading network orders are fully satisfied; sunflower oil is available in a wide assortment.

In September–October, the soybean oil and meal production increased by 14.7% and 21.7%, respectively. The rapeseed oil production increased significantly – by 59.1% (July–October 2021/22 MY).

Regarding the forecast of the vegetable oil production in 2021/22 MY, a significant increase is predicted compared to 2020/21 MY. In particular, the sunflower oil production is anticipated to grow by over 24% [14–20].

M.V. Zubets, V.P. Sytnyk, M.M. Havryliuk, P.T. Sabluk, and O.M. Spychak think that for effective variety renewal and replacement in the Forest-Steppe, scientifically sound calculations of the need for seeds of first generations are needed [21].

Thus, the area sown with winter wheat in the agrarian enterprises of the Forest-Steppe should be 1,977,400 hectares, with the first generation field area of 40,400 hectares and the second generation field area of 282,700 hectares. In turn, the annual demand for elite seeds is 11,600 tons; the first generation seeds (including the insurance fund) are needed at the amount of 80,800 tons. To renew and replace spring barley varieties, the total sown area should be 1,283,700 hectares, with the first generation field area of 26,200 hectares and the second generation field area of 183,500 hectares.

It was justified that, in 2021, 242 accessions were included into the State Register of Plant Varieties Suitable for Dissemination in Ukraine, including, as of September 31, 2021, 19 breeding innovations (accessions) or 8% bred at the Institute. The number of cereal, legume and groats crop accessions is 66, and 9 or 13.6% were added during the above period.

Unsatisfactory economic situation, lack of funds for producers of spiked cereal seeds to reproduce advanced capital, and insufficient paying capacity of consumers lead to a gradual decline in the profitability of the seed and grain industries [20–22].

The PPI nd.a. V.Ya. Yuriev, the main originator of breeding innovations, holds the priority position in the production of spiked cereal seeds of first generations at the regional level. The modern grain farming requires a systematic intensification-based increase in agricultural production. Owing to this trend in the economically developed countries in the last century, the reliable food security was ensured and these countries were consistently supplied with their own high-quality agricultural products. All varieties and hybrids bred at the PPI nd.a. V.Ya. Yuriev NAAS are highly adaptable to the growing conditions in the Steppe and Forest-Steppe of Ukraine.

Table 5 presents the average production and sales of seeds of first generations of winter and spring cereals, legumes and groats crops bred at the Plant Production Institute named after V.Ya. Yuriev of NAAS for 2017–2021.

We see that the need for seeds of first generations at the regional level is fully met, as the share of sales of winter wheat seeds averaged 60.4%.

Rozkishna, Shulyndinka, Harmonika, Zapashna, Doskonala, and Zdobna are the most competitive winter wheat varieties.

Table 5 shows that the need for seeds of first generations at the regional level is more than satisfied, as the share of sales of winter rye seeds averaged 85%. The newly created variety Stoir and hybrids Saturn and Yupiter are most in demand.

Table 5

Production and sales of seeds of first generations of winter and spring cereals, legumes and groats crops bred at the Plant Production Institute named after V.Ya. Yuriev of NAAS

Crop	2017–2021 average		
	Sold seeds, tons	Sold seeds, tons	Sale percentage
Winter wheat	262.21	158.30	60.4
Winter rye	93.81	79.68	84.9
Winter triticale	79.90	59.66	74.7
Spring wheat	90.21	33.03	36.6
Spring barley	146.72	87.82	60.0
Pea	225.56	166.2	74.0
Millet	54.30	37.46	69.0

The need for seeds of first generations at the regional level is fully met, as the share of seed sales averaged 75%. Ad 256, Amos, Nikanor, and Buket were the most competitive winter triticale varieties.

Analysis of the average sales of winter crop seeds of first generations in 2017–2021 indicates their gradual overproduction, as the sale percentages of these seeds ranged 60 to 85%. Therefore, it is necessary to scientifically rationalize the production of winter crop seeds of first generations for each generation.

As to the production and sales of spring cereals, legumes and groats crops, it was established that pea, millet and spring barley varieties were the most demanded ones among users of grain products (the sale percentage was 74%, 69%, and 60% respectively).

Oplot and Haiduk were the most competitive pea varieties; Modern, Avhur, and Ahrarii were the most competitive spring barley varieties; Spadshchyna and Uliublena were the most competitive spring wheat varieties; Konstantynivske, Vitrylo, and Kozatske were the most competitive millet varieties.

That is, most breeding innovations in these crops are competitive and of interest to buyers of the grain industry. Unfortunately, the spring wheat seed sale percentage did not exceed 37%, i.e. it was less attractive to buyers of the grain industry, creating a gradual shortage of this crop in the grain market in Eastern Ukraine. The Plant Production Institute named after V.Ya. Yuriev of NAAS specializes in the breeding and cultivation technologies of sunflower and is the coordinator of sunflower research at institutions of Ukraine.

The State Register of Plant Varieties of Ukraine contains data on 55 sunflower hybrids and 50 parents bred at the PPI nd.a. V.Ya. Yuriev NAAS. These varieties represent the full range of diversity of modern sunflower hybrids. Sunflower hybrids are highly adaptable to the growing conditions in the Steppe and Forest-Steppe of Ukraine, resistant to the most common diseases and can give up to 3.8–4.8 t/ha.

The introduction of sunflower confectionery hybrids Shumer, Forsazh, Hudvin, Nasoloda, Atlet, and Oplot will increase the level of raw material safety for the food, confectionery and technical industries and the investment attractiveness of the oil industry in the Kharkivska Oblast as well as of the grain market in Eastern Ukraine.

Unfortunately, significant fluctuations in grain yields, imperfect structure of the grain production, lack of mineral fertilizers and protection measures against pests and diseases, disruption of crop rotations, violations of zonal farming systems, and shortage of modern high-performance machines – all these factors reduce chances of successful implementation of breeding innovations.

Conclusions. In view of the aforesaid, the most important objectives are the use of innovative resource-saving technologies for growing crops, technical re-equipment of agricultural production, given its complex nature, opportunities to reduce agricultural costs, increasing sales through timely introduction of breeding innovations.

Thus, our results on the production and sales of seeds of winter and spring cereals, legumes, and groats crops at the regional level for the period of 2017–2021 indicate the feasibility of timely transfer of breeding/plant innovations with export potential (varieties, hybrids and parent components) bred at the Plant Production Institute named after V.Ya. Yuriev of NAAS, which is important for scientific justification of seed production volumes for each generation and is a guiding line for creating more profitable varieties or hybrids with the best genetic and export potential.

Список використаних джерел

1. Губенко І.В., Разінкова В.П. Проблеми розвитку інноваційної діяльності українських підприємств. Мат. конф. «Ринкова трансформація економіки постсоціалістичних країн: стан, проблеми, перспективи», Харків, 15–16 травня 2008 р. М-во аграр. політики, Харк. націон. техн. ун–т ім. П. Василенка, 2008. С. 151–153.
2. Поточна кон'юнктура і прогноз ринків сільськогосподарської продукції та продовольства в Україні на 2006/07 маркетинговий рік. Під ред. О.М. Шпичака. ІАЕ УААН. 2006. Вип. 17. С. 4–16.
3. Приймачук Т.Ю. Формування ринку насіння зернових колосових культур: автореф. дис. … канд. екон. наук: спец. 08.07.02 Економіка сільського господарства і АПК / Т.Ю. Приймачук. Житомир, 2006. 20 с.
4. Соколов В.М., Вишневський В.В., Чайка В.Г., Маматов М.О. Порядок організації насінництва в Україні. Матеріали Всеукр. наук.–практ. конф. «Сучасний стан та перспективи розвитку насінництва в Україні», Харків, 19–20 жовтня 2004 р. УААН, Інститут рослинництва В.Я. Юр'єва. Харків: ІР ім. В.Я. Юр'єва, 2004. С. 43–45.
5. Володін С.А. Інноваційний розвиток аграрної науки: монографія. К.: МАУП, 2006. 400 с.
6. Кирсанова А.Ю. Трансакционные издержки и эффективность инновационной деятельности сельскохозяйственных предприятий. Матеріали міжнар. форуму молодих вчених «Ринкова трансформація економіки: стан, проблеми, перспективи», Харків, 19–20 квітня 2007 р. М–во аграр. політики, Харк. націон. техн. ун–т ім. П. Василенка. Харків: Харк. націон. техн. ун–т ім. П.Василенка, 2007. С. 99–100.
7. Інноваційні ресурсозберігаючі технології: ефективність в умовах різного фінансового стану агроформувань: монографія за ред. Г.Є.Мазнєва. Харків: Майдан, 2014. 592 с.
8. URL: https://superagronom.com/news/14255-harkivschina-stala-liderom-za-pokaznikom-valovogo-zboru-zerna від 29 жовтня 2021 р.
9. URL: https://kharkivoda.gov.ua/news/112506?sv 22 жовтня 2021 р.
10. URL: https://superagronom.com/news/14398-onovleno-reyting-oblastey-za-valovim-zborom-ta-vrojaynistyu-silgospkultur-v-ukrayini від 19 листопада 2021 р.
11. URL: https://superagronom.com/news/14172-nazvano-top-3-oblasti-z-naynijchimi-pokaznikami-vrojaynosti-zernovih-kultur-v-ukrayini від 17 жовтня 2021 р.
12. URL: https://latifundist.com/novosti/56734-v-ukraine-namolotili-pochti-24-mln-t-podsolnechnika--urozhaj-onlajn-2021 17 вересня 2021 р.
13. URL: https://superagronom.com/news/13984-urojaynist-sonyashniku-v-ukrayini-mayje-na-chvert-vischa-nij-minulogo-roku від 17 вересня 2021 р.
14. URL: http://agroconf.org/content/potochna-situaciya-na-oliynomu-rinku від 25.11.2021 р.
15. Закон України «Про інвестиційну діяльність». Відомості Верховної Ради (ВВР), 1991, № 47, ст. 646.
16. Державна служба статистики України. Офіційний сайт. URL :http://www.ukrstat.gov.ua/

17. Міністерство аграрної політики та продовольства України. Офіційний сайт. URL :http://minagro.gov.ua
18. Органічне виробництво в Україні. 11.12.2020 р. URL: https://agropolit.com/news/12556-organichne-virobnitstvo-v-ukrayini-zrostaye-u-5-raziv-shvidshe-nij-v-yes
19. Клітна М.Р. Стан і розвиток органічного виробництва та ринку органічної продукції в Україні. *Ефективна економіка*. 2013. № 10.URL: http://www.economy.nayka.com.ua/?op=1&z=2525.
20. Лобас М.Г. Розвиток зернового господарства в Україні. К.: 1997. 447 с.
21. Наукові основи агропромислового виробництва в зоні Лісостепу України. Під ред. М.В.Зубця. Київ: Логос, 2004. 776 с.
22. Матеріали Всеукраїнської науково–практичної конференції «Сучасний стан та перспективи розвитку насінництва в Україні», присвяченої 125–річчю від дня народження академіка В.Я. Юр'єва, 19–20 жовтня 2004 р. Харків: ІР ім. В.Я. Юр'єва, 2004. 124 с.

References

1. Hubenko IV, Razinkova VP. Problems of development of Ukrainian enterprises' innovative activities. Proc. of the conf. "Market transformation of the economy of post-socialist countries: status, problems, prospects". Kharkiv, 2008 May 15–16. Ministry of Agrarian Policy, Kharkiv National Technical University named after P Vasylenko, 2008. P. 151–153.
2. Current situation and forecast of markets for agricultural products and food in Ukraine for the 2006/2007 marketing year. In: OM Shpychak, red. IAE UAAS. 2006; 17: 4–16.
3. Pryimachuk TYu. Formation of the market for spiked cereal seeds. [dissertation]. Zhytomyr, 2006.
4. Sokolov VM, VyshnevskyimVV, Chaika VH, Mamatov MO. Organization of seed production in Ukraine. Proceedings of the All-Ukrainian Scientific–Practical Conf. "Current Status and Prospects of Seed Production Development in Ukraine". Kharkiv, 2004 Oct 19–20. UAAS, Plant Production Institute nd. a. VYa Yuriev. Kharkiv: PPI, 2004. P. 43–45.
5. Volodin SA. Innovative development of agrarian science. Kyiv: MAUP, 2006. 400 p.
6. Kirsanova AYu. Transaction costs and efficiency of innovation activities of agricultural enterprises. Proceedings of the Intern. Forum of Young Scientists "Market Transformation of the Economy: Status, Problems, Prospects". Kharkiv, 2007 Apr 19–20. Ministry of Agrarian Policy, Kharkiv National Technical University named after P Vasylenko. Kharkiv: Kharkiv National Technical University named after P Vasylenko, 2007. P. 99–100.
7. Innovative resource-saving technologies: efficiency under different financial conditions of agrarian enterprises. In: HYe Mazniev, red. Kharkiv: Maidan, 2014. 592 p.
8. URL: https://superagronom.com/news/14255-harkivschina-stala-liderom-za-pokaznikom-valovogo-zboru-zerna.
9. URL: https://kharkivoda.gov.ua/news/112506?sv.
10. URL: https://superagronom.com/news/14398-onovleno-reyting-oblastey-za-valovim-zborom-ta-vrojaynistyu-silgospkultur-v-ukrayini.
11. URL: https://superagronom.com/news/14172-nazvano-top-3-oblasti-z-naynijchimi-pokaznikami-vrojaynosti-zernovih-kultur-v-ukrayini.
12. URL: https://latifundist.com/novosti/56734-v-ukraine-namolotili-pochti-24-mln-t-podsolnechnika--urozhaj-onlajn-2021.
13. URL: https://superagronom.com/news/13984-urojaynist-sonyashniku-v-ukrayini-mayje-na-chvert-vischa-nij-minulogo-roku.
14. URL: http://agroconf.org/content/potochna-situaciya-na-oliynomu-rinku.
15. Law of Ukraine "On Investment Activities". Vedomosti Verkhovnoi Rady (VVR). 1991; 47: 646.
16. State Statistics Service of Ukraine. Official site. URL :http://www.ukrstat.gov.ua/
17. Ministry of Agrarian Policy and Food of Ukraine. Official site. URL :http://minagro.gov.ua

18. Organic production in Ukraine. 11.12.2020. URL: https://agropolit.com/news/12556-organichne-virobnitstvo-v-ukrayini-
19. Klitna MR. The status and development of organic production and the market of organic products in Ukraine. Efektyvna ekonomika. 2013; 10.URL: http://www.economy.nayka.com.ua/?op=1&z=2525.
20. Lobas MH. Development of grain farming in Ukraine. Kyiv: 1997. 447 p.
21. Scientific basics of agribusiness in the Forest-Steppe of Ukraine. In: MV Zubets, red. Kyiv: Logos, 2004. 776 p.
22. Proceedings of the All-Ukrainian Scientific–Practical Conf. "Current status and prospects of the seed production in Ukraine" dedicated to the 125th anniversary of Academician VYa Yuriev's birth, 2004 Oct 19–20. Kharkiv: PPI, 2004. 124 p.

ОСНОВНІ АСПЕКТИ МІЖРЕГІОНАЛЬНОГО ТРАНСФЕРУ СЕЛЕКЦІЙНО-НАСІННИЦЬКИХ ІННОВАЦІЙ З ЕКСПОРТНИМ ПОТЕНЦІАЛОМ

Єгоров Д.К., Єгорова Н.Ю., Ульянченко О.В., Капустян М.В., Кравченко І.О., Токар І.В., Сарапін Г.П., Бордун М.Д.
Інститут рослинництва імені В.Я.Юр'єва НААН, Україна

Мета. Вивчення та обґрунтування основних аспектів міжрегіонального трансферу селекційно-рослинницьких інновацій з експортним потенціалом, синергічної взаємодії науки, освіти та товаровиробництва для більш стрімкого інноваційного розвитку регіонів країни.

Матеріал та методи. Методами досліджень були діалектичний, абстрактно-логічний, монографічний, розрахунково-конструктивний, економіко-статистичний, графічного моделювання та інші. Дослідження базувалися на Законах України, нормативних актах та інструктивних положеннях з питань ринкових відносин в аграрному секторі та галузі насінництва; статистичних даних та звітів базових господарств інституту.

Обговорення результатів. Для своєчасного трансферу у виробництво більш адаптованих сортів, гібридів та батьківських компонентів було проведено аналіз кількості зразків ІР імені В.Я.Юр'єва НААН у Державному реєстрі сортів рослин, придатних до поширення в Україні на 2021 рік. У результаті виявлено, що в 2021 р. кількість зразків основних сільгоспкультур селекції інституту в порівнянні з 2017 р. зменшились на 15 одиниць, при цьому протягом цих років більшість селекційних інновацій користується попитом у товаровиробників зернової галузі.

Тобто гострої необхідності для створення якомога більшої кількості нових сортів не виникає, а процес упровадження селекційних інновацій у виробництво проходить поступово, з урахуванням побажань товаровиробників та змін у ринковому середовищі. Зокрема, найбільш конкурентоспроможними сортами озимої пшениці є Розкішна, Шулиндінка, Гармоніка, Запашна, Досконала та Здобна, жита – сорт Стоір і гібриди Сатурн та Юпітер, озимого тритикале – Ад 256, Амос, Ніканор та Букет.

Аналіз реалізації насіння вищих репродукцій озимих культур у середньому за 2017–2021 рр. вказує на поступове його перевиробництво, адже питома вага продажу цього насіння становить від 60 до 85%.

Стосовно виробництва та реалізації ярих зернових, зернобобових та круп'яних культур визначено, що найбільшим попитом у користувачів зернової продукції користуються сорти гороху, проса та ярого ячменю (частка реалізації становить 74%, 69% та 60% відповідно). Найбільш конкурентоспроможними сортами гороху є Оплот та Гайдук, ярого ячменю – Модерн, Авгур та Аграрій, ярої пшениці – Спадщина та Улюблена, проса – Константинівське, Вітрило та Козацьке.

Висновки.Таким чином, результати дослідження за період 2017–2021 рр. вказують на доцільність своєчасного трансферу селекційно-рослинницьких інновацій з експорт-

ним потенціалом (сортів, гібридів та батьківських компонентів), що є важливим для наукового обґрунтування обсягів виробництва насіння по кожній відповідній репродукції та є орієнтиромдлястворення більш прибуткового сорту або гібриду з найкращим генетичним та експортним потенціалом.

Ключові слова:*селекційно-рослинницькі інновації з експортним потенціалом, трансфер, насіннєва галузь, зернове виробництво, міжрегіональні ринкові відносини*

MAJOR ASPECTS OF INTERREGIONAL TRANSFER OF BREEDING/SEED INNOVATIONS WITH EXPORT POTENTIAL

Yehorov D.K., Yehorova N.Yu., Ulianchenko O.V., Kapustian M.V., Kravchenko I.O.,
Tokar I.V., Sarapin H.P, Bordun M.D.
Plant Production Institute named after V.Ya. Yuriev of NAAS, Ukraine

Purpose. To study and rationalize the main aspects of interregional transfer of breeding/plant innovations with export potential, of synergistic interaction between science, education and commodity production for more rapid innovative development of the country's regions.

Material and methods. The study methods were dialectical, abstract-logical, monographic, computational/constructional, economic-statistical, graphic modeling and others. The study was based on the Laws of Ukraine, regulations and guidelines on market relations in the agrarian sector and seed production; statistical data and reports of basic farms of the institute.

Results and discussion. For timely transfer of more adapted varieties, hybrids and parental components to production, we analyzed the numbers of accessions bred at the PPI nd.a. V.Ya. Yuriev NAAS in the State Register of Plant Varieties Suitable for Dissemination in Ukraine in 2021. As a result, we found that in 2021 the number of the major crop accessions bred at the Institute decreased by 15 compared to 2017, while during these years most breeding innovations were in demand from grain producers.

That is, there is no urgent need to create as many new varieties as possible, and the implementation of breeding innovations into production is gradual, with due account for producers' wishes and the market changes. In particular, the most competitive winter wheat varieties were Rozkishna, Shulyndinka, Harmonika, Zapashna, Doskonala, and Zdobna; variety Stoir and hybrids Saturn and Yupiter were the most competitive rye accessions; Ad 256, Amos, Nikanor and Buket were the most competitive winter triticale varieties.

Analysis of the average sales of winter crop seeds of first generations in 2017–2021 indicated their gradual overproduction, as only 60–85% of these seeds were sold.

Regarding the production and sales of spring cereals, legumes and groats crops, we learnt that pea, millet and spring barley varieties were in the greatest demand from users of grain products (the sale percentage was 74%, 69%, and 60%, respectively). The most competitive pea varieties were Oplot and Haiduk; Modern, Avhur, and Ahrarii were the most competitive spring barley varieties; Spadshchyna and Uliublena were the most competitive spring wheat varieties; Konstantynivske, Vitrylo, and Kozatske were the most competitive millet varieties.

Conclusions. Thus, the results of the study for the period of 2017–2021 proved the feasibility of timely transfer of breeding/plant innovations with export potential (varieties, hybrids and parental components), which is important for scientific justification of seed production volumes for each generation and is a reference point for creating more profitable varieties and hybrids.

Key words*: breeding/plant innovations with export potential, transfer, seed industry, grain production, interregional market relations*