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EVALUATION OF WINTER WHEAT VARIETIES BY FLOUR YIELD WITH GRAIN YIELD

Formation of productivity, nominal flour yield and flour yield with winter wheat harvest depending on the variety and peculiarities of weather conditions during years of research are studied. It is determined that growing varieties of Akrotos, Kopilyvchanka and Romantyka provides the highest yield and flour yield.

Key words: winter wheat, yield, flour yield

Introduction. The main assessment grade is the value of the performance and quality of grain, however, not always high yield corresponds to the high output of the ready product during processing. Therefore, the assessment of winter wheat varieties on the output of flour as with units of grain and its yield is necessary.

Analysis of the last researches and publications. The main strategic grain variety of Ukraine is soft winter wheat. It covers 6.5 million hectares of cultivated areas, representing over 40% of the total area of grain varieties. In forming yield of this crop the outstanding role belongs to the variety. Effect of variety on yield can reach 50% [1, 2].

In recent years, manufacturers of winter wheat experienced significant climate change. Stability of variety yield is largely dependent on temperature fluctuations in winter, freezing in snowless winters, thaw, ice cover, drought or water logging during the growing season, plant lesions by fungal diseases, etc. [3]. Degree and character of changes of environmental conditions can significantly affect the yield of winter wheat, because, according to experts, the variability of weather causes significant (40-60%) yield fluctuations of this crop [4, 5].

Aim of the research is to study nominal flour yield and flour yield with winter wheat harvest depending on the variety of winter wheat.

Materials and methods. Experimental work was carried out in conditions of educational-research-production department of Uman National University of Horticulture during 2011-2013.

General agriculture of winter wheat cultivation is common for the Right-Bank Forest-Steppe of Ukraine [6]. In the experiment winter wheat was grown, the predecessor of which was vetch oats for green fodder. Soil of the research field is podzolic hard loamy chernozem on loess. The content of humus in the arable layer is 3.2-3.3%, the degree of saturation by bases is 90-93%, the reaction of the soil solution is medium acidic (pH = 5.5), hydrolytic acidity is 1.9-2.3 mol/kg of soil, the content of mobile phosphorus and potassium compounds (for ISO 4115-2002) - 100-115 mg/kg, nitrogen of alkaline hydrolyzed compounds (Cornfield's method) – 100–110 mg/kg of soil [7].

Total area was 5 m², repetition of the experiment – four times, plot location was consistent. Laying field experiments, making observations and researches carried out in accordance with the recommendations, guidelines and handbooks recent years [8]. Crop was harvested in plots, mathematical and statistical analysis of data was carried out using the standard software package “Microsoft Excel 2003”.

Research results. Our studies revealed that the greatest yield varieties Jubiljar Myronivskiyi, Khmelnychanka, Romantyka and Akrotos had, which exceeded the standard at 15-46%, which was also significant compared with $HIP_{05}=0,31-0,50$ during years of research. The yield of the remaining varieties fluctuated within 6.95-7.58 t/ha.

Favorable temperature and water regime in 2011 contributed to more grain yield of winter wheat which fluctuated within 7.35-13.86 t/ha. High temperature during the growing season of wheat in 2012 and lack of moisture in the phase of grain formation caused getting lower grain yield (7.19-13.45 t/ha). In 2013 grain yield decreased considerably and fluctuated within 4.21-5.95 t/ha (Table 1).

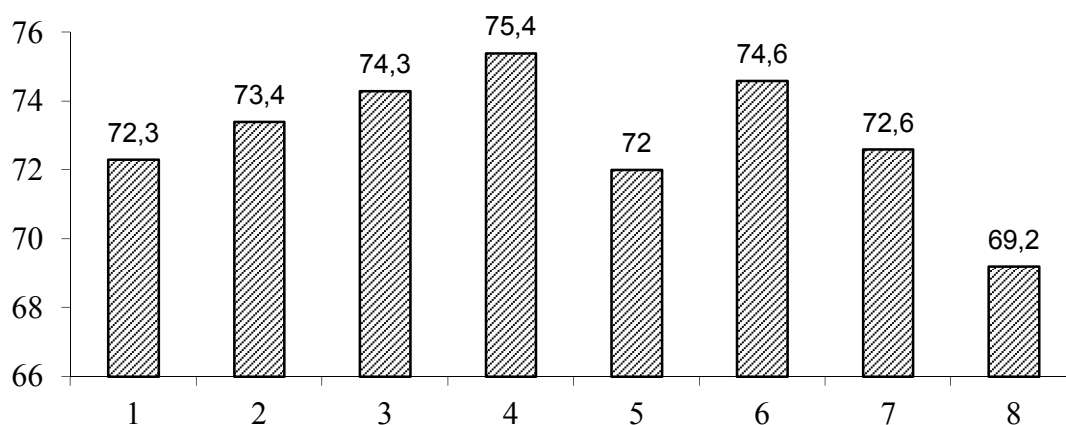
Table 1

Winter wheat yield depending on the variety, t/ha

Variety	Research year			Average over three years
	2011	2012	2013	
Podolianka (cr.)	9,12	8,41	5,21	7,58
Romantyka	11,58	11,92	4,32	9,27
Kopilyvchanka	8,24	7,95	5,76	7,32
Khmelnichanka	11,39	11,03	5,04	9,15
Akrotos	13,86	13,45	5,95	11,08
Diskus	7,47	7,19	3,42	6,03
Jubiljar Myronivskiyi	11,25	10,86	4,21	8,77
Kubus	7,35	7,68	5,84	6,95
HIP ₀₅	0,47	0,50	0,31	

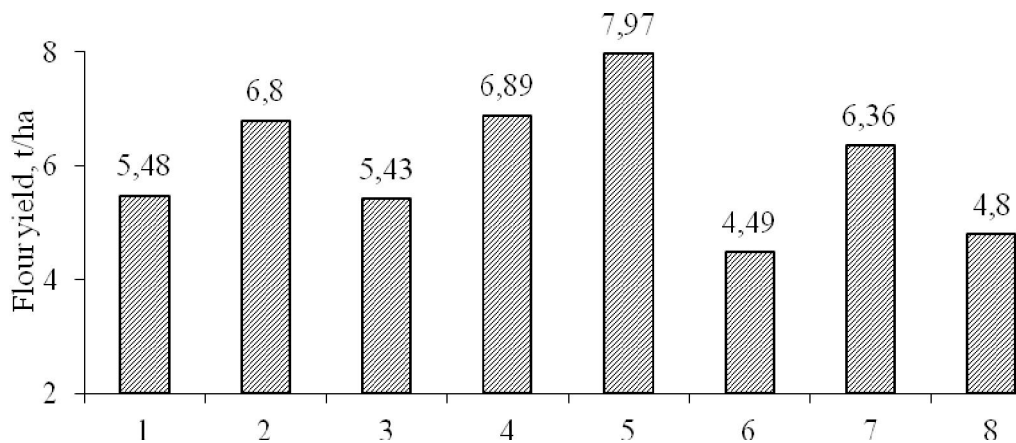
Estimated yield of winter wheat flour varied depending on the variety (Fig. 1). All studied varieties of winter wheat were characterized by high nominal yield of flour per unit of grain, but its highest yield was obtained from grain varieties Kopilyvchanka – 74.3%, Discus – 74.6% and Khmelnichanka – 75.4%, in other varieties this figure fluctuated within 69,2-73,4% (Figure 1).

Flour yield of grain harvest of winter wheat on average over three years varied from 4.49 t/ha to 7.97 t/ha depending on the variety. The highest flour yield was of varieties Romantyka – 6.8 t/ha, Khmelnichanka – 6.89 and Akrotos – 7.97 t/ha, which exceeded the standard at 24-45%. The lowest flour yield was of varieties Diskus – 4.49 t/ha and Kubus – 4.8 t/ha.



1 – Podolianka (cr.); 2 – Romantyka; 3 – Kopilyvchanka; 4 – Khmelnichanka; 5 – Akrotos; 6 – Diskus; 7 – Jubiljar Myronivskiyi; 8 – Kubus.

Figure 1. Nominal flour yield per grain unit of winter wheat depending on the variety (2011-2013), %



1 – Podolianka (ст.); 2 – Romantyka; 3 – Kopilyvchanka; 4 – Khmelnychanka;
5 – Akrotos; 6 – Dyskus; 7 – Jubilar Myronivskiy; 8 – Kubus.

Figure 2. Flour yield per grain unit of winter wheat depending on the variety (2011-2013), %

Conclusions. Yield of winter wheat varies depending on the variety and weather conditions. Thus, the greatest yield varieties Jubilar Myronivskiy, Khmelnychanka, Romantyka and Akrotos have. The highest nominal flour yield (74.3-75.4%) varieties Kopilyvchanka, Dyskus and Khmelnychanka have, the highest flour yield of grain yield of winter wheat variety Akrotos has (7.97 t/ha).

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Анотація

Осокіна Н.М., Полянецька І.О., Любич В.В., Возіян В.В.

Оцінка сортів пшениці озимої за виходом борошна з урожаєм зерна

Досліджено формування врожайності, умовного виходу борошна і вихід борошна з урожаєм пшениці озимої залежно від сорту та особливостей погодних умов років досліджень. Встановлено, що найвища врожайність та вихід борошна забезпечує вирощування сортів Акротос, Копілівчанка і Романтика.

Ключові слова: пшениця озима, урожайність, вихід борошна

Аннотация

Осокина Н.М., Полянецкая И.О., Любич В.В., Возиян В.В.

Оценка сортов озимой пшеницы по выходу муки с урожаем зерна

Исследовано формирование урожайности, условного выхода муки и выход муки с урожаем озимой пшеницы в зависимости от сорта и особенностей погодных условий лет исследований. Установлено, что самая высокая урожайность и выход муки обеспечивает выращивание сортов Актрос, Копілівчанка и Романтика.

Ключевые слова: озимая пшеница, урожайность, выход муки