СЕКЦІЯ 5. РОСЛИННИЦТВО ТА ЗЕМЛЕРОБСТВО

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FORMATION OF BAKING PROPERTIES OF SPELT WHEAT GRAIN DEPENDING ON THE VARIETY AND STRAINS

Wheat is one of the most ancient of domesticated crops. Archaeological evidence of cultivated spelt has been found in the Transcaucasus region, northeast of the Black Sea, dating back to 5,000 B.C. (Boland, 2011; Stallknecht et al., 1996; van Wyk, 2005). The nutritive value of spelt wheat is high and it contains all the basic components which are necessary for human beings such as sugars, proteins, lipids, vitamins and minerals. The crude protein composition of spelt varies from 15 to 20 g/100 g grains while, e. g. that of Finnish winter wheat is reported to be 11–12 g/100 g. Grain of spelt is claimed to be naturally higher in fibre, B vitamins and carbohydrates than wheat, but the results vary greatly (Kohajdovб Z., Karoviиovб J., 2007).

Experimental work was carried out in the Laboratory “Quality assessment of grain and grain products” of Department of Technology of Storage and Processing of Grain at Uman National University of Horticulture. Grain of different varieties of spelt wheat of the European selection was used, such as:‘ Schwabenkorn’ (Austria), ‘NSS 6/01’ (Serbia), ‘Shvedska 1’ (Sweden), strains obtained by hybridization of *Tr. aestivum / Tr. spelta* – ‘LPP 1197’, ‘LPP 3117’, ‘LPP 1304’, ‘LPP 1224’, ‘LPP 3122/2’, ‘P 3’, ‘LPP 3132’, ‘LPP 3373’, ‘LPP 1221’, introgressive strains ‘NAK 34/12–2’ and ‘NAK 22/12’ obtained by hybridization of *Tr. aestivum*/ amphiploid (*Tr. durum/ Ae. tauschii*) and introgressive strain ‘TV 1100’ obtained by hybridization of *Tr. aestivum* (Kharkivska 26’ variety) / *Tr. kiharae* with a selection of winter form that were grown under conditions of Right-Bank Forest-Steppe of Ukraine. The check variant is the recognized variety of spelt wheat ‘Zoria Ukrainy’ (st).

The content and gluten deformation index was measured by SSTU ISO 21415-1:2009, falling-number value was determined according to GOST 30498–97 and amount of bread was determined by the method of state sort testing. The endosperm content was determined by the improved method described in the patent for utility model “Method of determining the endosperm content in triticale and wheat grain” № u 2016 06341 and the content of corcule and membranes was calculated (Hospodarenko G. M., Liubych V. V., Novikov V. V. and others, 2016). Flour yield was determined by grinding spelt wheat samples weighing 1 kg at MBP-000342.90 mill and ash content was determined by SSTU 4252:2003.

Mathematical data processing was performed by one-way analysis of variance, correlation and regression analysis was performed according to conventional methods. R. E. Chaddock scale was used to assess the closeness of the connection

between studied indicators which by correlation coefficient of 0.10–0.30 is weak, 0.30–0.50 is moderate, 0.50–0.70 is significant, 0.70–0.90 is high and 0.90–0.99 is very high.

The research has found that the gluten content varied from 25.5 to 46.3 % depending on the variety and strain. None variety exceeded the control one in which the figure was 46.3 %. The gluten content of 'Zoria Ukrainy', 'Schwabenkorn' and 'NSS 6/01' varieties, 'LPP 1221' and'TV 1100' strains was very high (over 36.0 %). It was high (31.0–35.9 %) speaking about'LPP 1197', 'P 3', 'NAK 34/12–2' and 'NAK 22/12' strains. 'LPP 3117' strain had low gluten content (21.0–25.9 %). This figure of other varieties and strains was average (26.0–30.9 %).

It was found that the gluten content varied significantly over the years of research. High gluten content of 'Zoria Ukrainy' and 'Schwabenkorn' varieties, 'NAK 22/12' and 'TV 1100' strains in 2013 was caused by the formation of larger vegetative mass. In addition, these varieties have formed high gluten content over the years of research. Decreasing of the gluten content in grains of other varieties and strains varied depending on the lodging resistance and affection by brown leaf rust and Septoria spot pathogens. It was determined that the falling number was changing from 379 to 416, depending on the variety and strain. However, alpha-amylase activity is low and the starch state is excellent. Thus, carbohydrate-amylase complex was optimal for bakery production.

Studies show that the bread average significantly varied from very low to high one. Grains of 'Zoria Ukrainy' variety (523 cm^3) and 'NAK 34/12' (484 cm^3) strain gave the high bread amount. The average amount of bread was of 'Shvedska 1' variety (454 cm^3) and 'LPP 3132' strain (460 cm^3). Grains of 'NSS 6/01' variety, 'LPP 3373', 'LPP 1197' and 'TV 1100' strains gave a low amount of bread (375–425 cm^3) and other strains gave a very low amount of bread.

Baking properties of spelt wheat grain vary considerably depending on the variety, strains and weather conditions. Grains of 'Zoria Ukrainy' and 'Schwabenkorn' varieties, 'LPP 1197', 'NAK 34/12–2' and 'TV 1100' strains are characterized by consistently high gluten content. However, the greatest amount of bread is obtained from flour of 'Zoria Ukrainy' and 'Shvedska 1' varieties, 'NAK 34/12–2' and 'LPP 3132' strains.

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РАЗМЕЩЕНИЕ СЕМЕННОГО ТРАВОСТОЯ БОБОВЫХ ТРАВ НА СКЛОНОВЫХ ЗЕМЛЯХ

В интенсификации кормопроизводства и биологизации земледелия особая роль отводится полевому травосеянию, в котором важное значение имеют многолетние бобовые травы. Благодаря своей мощной корневой системе, многолетние травы сдерживают процессы эрозии на склоновых