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Sinecological fundamentals of manifestation of tolerance of new genotypes of *Tribus triticeae* on influence of *Eurygaster integriceps* put

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The purpose. To study tolerance of new genotypes of *Tribus Triticeae* on influence of *Eurygaster integriceps* Put. in conditions of forest-steppe and polisya-forest-steppe ecotopes. **Methods**. Field, laboratory, methods of mathematical statistics. Field: elaboration of experiment, formation of record plots, determination of biological yield of grain; laboratory: assessment of quantitative and quality parameters of grain, its damage by pests. **Results**. Population performances of *Eurygaster integriceps* Put are studied depending on genotype of cereal crop and ecological conditions. It is fixed that phytocenoses of triticale and rye are the unfavourable environmental niche for *Eurygaster integriceps* Put. in comparison with soft wheat. In this connection they are differentiated into improbable eco-niches (Borotba, Slavetne, AD 256, Chayan, DAU 5, Chornoostyste); probable eco-niches (Vivate Nosivske, Pshenychne, Avgusro, Yaguar); very probable eco-niches (Ellada). **Conclusions**. In conditions of foreststeppe and polissia-forest-steppe ecotopes sowings of soft winter wheat medium-serotinal and middle-ripening cultivars are less ecologically tolerant to imago of bug. It is fixed that genotypes of winter triticale are unfavourable environmental niche for pests-phytophags in comparison with wheat and rye. In this connection they are differentiated into improbable econiches (Slavetne, AD 256, Chayan, DAU 5, Chornoostyste); probable eco-niches (Vivate Nosivske, Pshenychne, Avgusto, Yaguar); very probable eco-niches (Ellada).

Key words*: genotypes of soft winter wheat, winter rye and winter triticale, imago of Eurygaster integriceps Put., environmental niche, strategy of the supervisory control of density and numerosity of populations of the pest.*

Introduction. The main purpose of modern of agrarian production – getting high and stable yield of high-quality grain. in front of Agricultural science faces the task to develop and introduce in production is not only cost effective but also environmentally safe and cost-effective methods of protecting grain fields. To solve this problem, first of all, will help trustworthy information about the specific interconnections which exist between cultural plant species and abiotic and biotic factors of negative impacts, characteristics of their biological development and forecast the number of items, localization and character of resettlement pests.

Analysis of recent research and publications. The leading by scientists established [1-3,7] that in agrocenoses there are about 300 species of phytophages, including in the first place – the Bedbug harmful turtle (*Eurygaster integriceps* Puton, 1881) that feeding on grain, including wheat, not only drastically reduces the number, but also greatly affects the quality of grain [1]. Winter crops attracted attention by the following features: a stable yield, food and forage value of grain, resistance to adverse abiotic and biotic factors [2]. Over the last decade on protection of soft winter wheat against pests, diseases and weeds are increasingly paying attention to ecological and biocenotical concept of adaptive agriculture [3]. Area of periodic mass reproduction *E. integriceps* – regions the Central and South-eastern Forest-Steppe. But according M. Sekun [1], character of migration and the sedentary populations varies greatly in different ways manifested in certain ecotypes.

The purpose. Synekologycal bases manifestation of sensitivity of new genotypes wheat soft, triticale and rye winter, on harmful effect *Eurygaster integriceps* Put. in the central Forest-Steppe and transition zone Forest-Steppe-Polissia of Ukraine.

Materials and methods. Stationary researches were conducted in the conditions of the central part of the Forest-Steppe (educational and research center of the Bila Tserkva National Agrarian University (ERC BNAU), and production – in the transition zone of the Forest-Steppe-Polissia (Nosivska breeding-research station of the V. M. Remeslo Myronivskyi Institute of Wheat NAAN) during 2001-2014. Laying an experiment, observing, taking into account the species composition and behavior of pests in the dynamics were determined according to generally accepted methods [4-6]. The species composition of arthropods was calculated by determinants [7]. Pest records were carried out every 14 days, taking into account the phenophase of the development of grain crops. (by F. M. Cooperman, 1984 and by the system Zadoks BBCH).

For the experiment genotypes of lines and varieties of soft winter wheat were used: КС 5, КС 1, Nosshpa 100, Prydesnianska napivkarlikova, Л 41/96, КС 7, КС 22, КС 17, КС 14, Daushka, Poliska 90, Myronivska 65, Yuvivata 60; the winter triticale: Slavetne, АД 256, Chayan, ДАУ 5, Chornoostyste, Vivate Nosivske, Pshenychne, Avhusto, Yahuar, Ellada; rye winter: Borotba. Mathematical processing of the results was performed on a personal computer, using Statistics 6.0 and Excel 2003 programs.

Results. As a result of years of research (2001-2005, 2008-2013,.) it was established that in the conditions transition zone Forest-Steppe-Polissia and central Forest-Steppe of Ukraine in agrobiocenoses winter cereals dominant insects-consort is: *Oulema gallaeciana* (Heyden, 1870) (syn. *O. lichenis* Voet, 1806); *Oulema melanopus* (Linnaeus, 1758), *Sitobion avenae* (Fabricius, 1775), *Phyllotreta vittula* (Redtenbacher, 1849), beetles of the family *Anisoplia* (*Anisoplia austriaca* (Herbst, 1783)), *Haplothrips tritici* (Kurdjumov, 1912) and *Eurygaster integriceps* (Puton, 1881) etc. But thorough entomological monitoring showed that in the dynamics on crops of wheat soft winter, triticale winter and rye winter is the most numerous phytophagous *Eurygaster integriceps* Put.

In the conditions transition zone Forest-Steppe-Polissia in crops of cereal increase in the number of *Eurygaster integriceps* Put. observed in 2001, when its maximum growth (9 imago/m^2) lasted until 2002 compared to 1998-2000 (Fig. 1).

In phytocenoses wheat soft winter number imago Eurygaster integriceps was significantly (p = 0.95) greater than on crops of triticale winter and rye winter (Fig. 2).

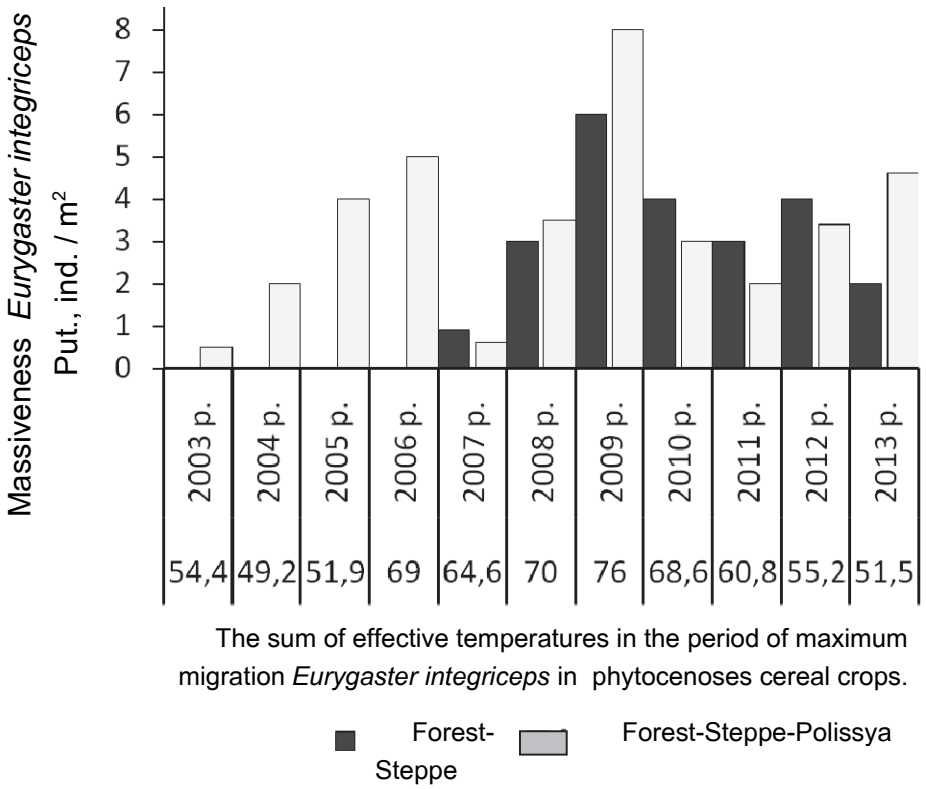

Fig. 1. The dynamics of massiveness imago E. integriceps in crops of winter triticale, ind./m^2

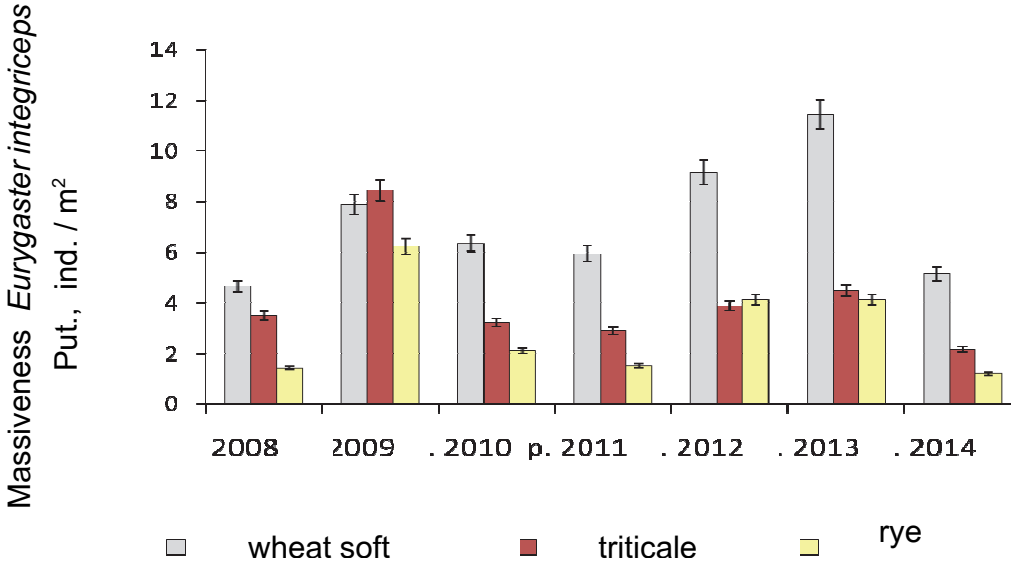

Fig. 2. Comparative dynamics of massiveness E. integriceps, ind./m², experimental field of teaching and scientific research center Bila Tserkva National Agrarian University, central Forest Steppe of Ukraine

It should be noted that crops of early maturing and middle early maturing genotypes wheat soft winter: KC 5; KC 14, KC 1 and Nosshpa 100 were significantly is less populated imago *Eurygaster integriceps* Put. (Fig. 3).

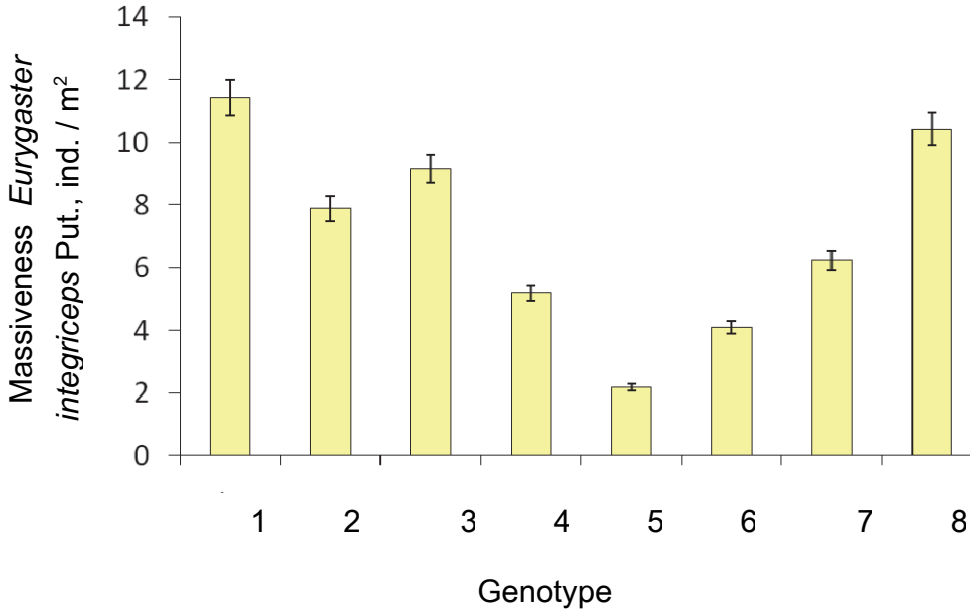

Fig. 3. Differentiation genotypes of wheat soft winter in probability to be ecological niche for a E. integriceps, the average data for 2011–2013, Experimental field Education and Research Centre Bila Tserkva National Agrarian University (central Forest-Steppe of Ukraine): 1 – Myronivska 65; 2 – Poliska 90; 3 – Yuvivata 60; 4 – KC 1; 5 – KC 5; 6 – Nosshpa 100; 7 – KC 14; 8 – Zoriana Nosivska

In 2007–2008 on experimental field in the forest-steppe in phytocenoses of wheat soft winter and triticale winter observed population *Eurygaster maura* L. and *Aelia acuminata* L., who dominated in number compared with the number *Eurygaster integriceps* Put.

Cool and lingering springs of 2003, 2005 contributed to active development of the consort on winter crops. In 2009 conditions of in the central part of the Forest-Steppe is marked maximum density *E. integriceps*. Larvae and imago of this pest significantly brought considerable damage wheat soft – up to 40 %, of triticale winter – up to 25 % (Fig. 4).

Fig. 4. Damage of grain E. integriceps for years, the central Forest-Steppe of Ukraine,%

Established population density, numerosity and depredatory of *E. integriceps* in dynamic on cenosis different genotypes of white straw crops. For the transition zone of the Forest-Steppe-Polissia (Nosivskyi and Ichnianskyi districts of the Chernihiv region), grain damage by the insect was lower in wheat – on 20 and triticale – 14 % (Fig. 5).

Fig. 5. Damage of grain with E.. integriceps for years, ecotope of the transition zone of Forest-Steppe-Polissia,%

Consequently, in the conditions of the Polissia and Forest-Steppe ecotops, the amount of damaged grain in 2009 was in wheat soft winter in 3 and 10 times, and triticale winter 2 and 4 times higher than in 2001-2008 and 2010-2013. It was found that the pest on the crops of cereals leads to the death of the central leaf, full or partial whitening of the ear, deformation of the oysters, wrinkling of the grain. (Fig. 6).

Fig. 6. Signs of damage to grain crops by E. integriceps

An analysis of the topography of lesions of various genotypes of winter triticale and soft winter wheat suggests that on the colossus the bugs are placed on different tiers, but are mostly concentrated in the middle and lower. Irrespective of the type and variety of grain crops, the maximum number of "injections" of this consort is concentrated in the basal part of the grains - the spinach and the germinal zone, which significantly affects the quality of the grain.

For imago *E. integriceps* cultivars and lines of wheat by the probably will be ecological niche differentially in the following groups: olig-likely niche – short-stalked, awned, early ripening forms (КС 5, КС 14, КС 1) and compact ears, awneds (Nosshpa 100, Л 41/96); *likely niche* – medium-grown, awned, medium ripening (Prydesnianska napivkarlykova, КС 7, КС 22, КС 17, Daushka); significant likely niche not compact ears, mid-season, awned, medium-grown (Poliska 90, Yuvivata 60, Myronivska 65).

On the basis of the complex analysis of seed grain of the resistant varieties of triticale, wheat and winter rye the damage caused by the bug of the harmful turtle causes a decrease in the field similarity of the grain and the liquefaction of stacks – by 10–18 % (Fig. 7).

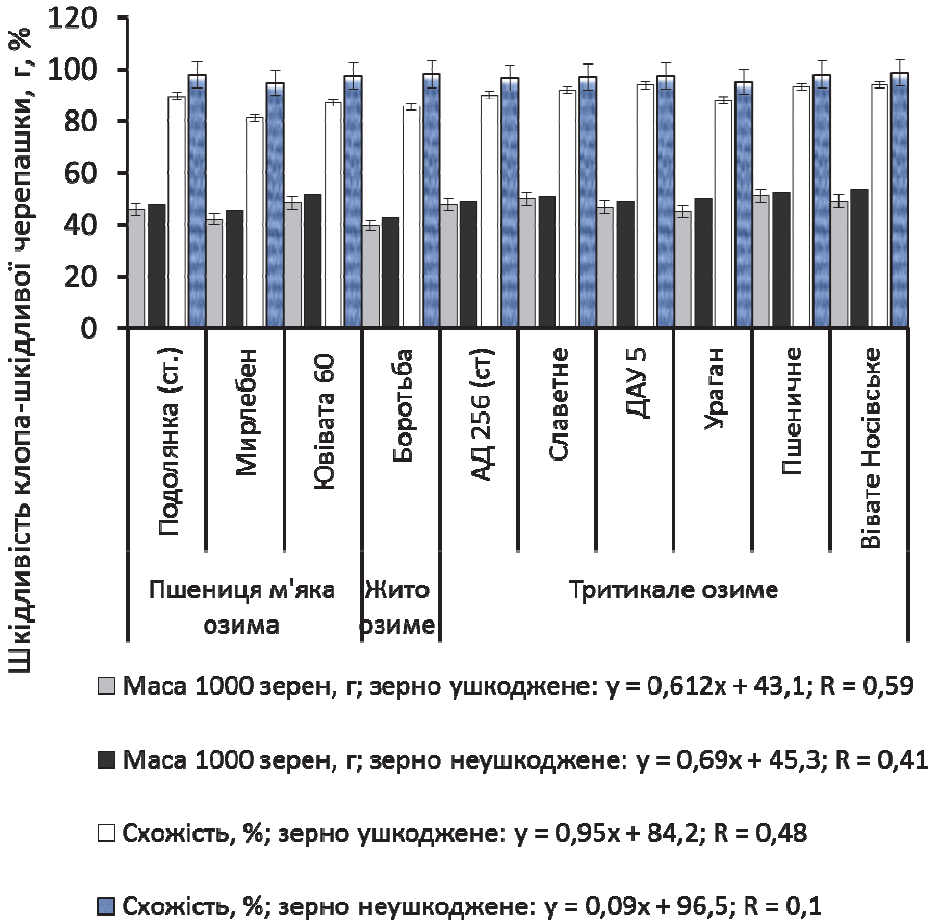

Fig. 7. Consequences of damage to grain crops by bug, average for 2008-2013, central Forest-Steppe of Ukraine

In 2012 and 2013, the harmfulness of bird bedding on early-seeded varieties of Vivaet Nosivske, Pshenichne was more reliable (P=0.95%) than in previous years. In this regard, the yield of grain triticale at the edges of crops, compared to unaffected crops, was 0.4-0.5 c/ha less. In addition to a number of abiotic factors, the species and varieties of winter crops as a determinant, their spatial location (near forest bands, gardens, roadside roads), and the quality and timeliness of pest records are reflected in quantitative and qualitative interrelationships of crop-diggers with consortium-pests. The more favorable development conditions for consortia, the lower the productivity of the determinant.

Established, phytocenoses of triticale and rye winter are lesser auspicious ekological niche for *Eurygaster integriceps* Put, compared with wheat soft winter therefore, they are differentially in: olig-likely niche (Borotba, Slavetne, АД 256, Chaian, ДАУ 5, Chornoostyste); *likely niche* – (Vivate Nosivske, Pshenychne, Avhusto, Yahuar); significant likely niche (Ellada).

Conclusions.

1. During the 2001-2014 years established that under conditions of Polissia-Forest-Steppe and central Forest-Steppe density and numerosity of imago bug in phytocenoses of wheat soft winter, triticale and rye winter usually medium-grown and medium ripening semi-dwarf types was the same and is varied only within the error of the experiment. Found that in the condition of Forest-Steppe-Polissia zone and Central Forest-Steppe winter crops, including medium-serotinous ripening і medium-ripening cultivars less ecological tolerant to imago *E. integriceps* harmful than crops of triticale winter and rye winter.

2. Found that on medium-early ripening crops and early ripening semidwarf genotypes of wheat soft winter (КС 5, КС 1, Л 41/96) density populations *E. integriceps* by the years of research an average of 2.2-2.6 times lower than crops medium-grown, medium-serotinous ripening cultivars.

3. Established, genotypes of triticale and rye winter are lesser auspicious ekological niche for *E. integriceps,* compared with wheat soft winter therefore, they are differentially in: olig-likely niche – (Borotba, Slavetne, АД 256, Chaian, ДАУ 5, Chornoostyste); likely niche – (Vivate Nosivske, Pshenychne, Avhusto, Yahuar); significant likely niche (Ellada).

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