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WEEDINESS OF SPRING BARLEY

crops depending on the forecrop in the Eastern Forest-Steppe of Ukraine

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Goal. *To determine the species composition of weeds, their dominant role, and to establish the type and level of weediness of spring barley crops grown after sugar beet, corn for grain ½ + soybean ½ and spring barley as forecrops in the conditions of the Eastern Forest-Steppe of Ukraine.* ***Methods****. The investigations were conducted in field experiments, in a stationary field, fixed nine-course-fallow-grain-row crop rotation and in monoculture of spring barley by means of route surveys.* ***Results.*** *According to our research during 2011—2017, in spring barley crops 56 species of weed plants were revealed. In the conditions of crop rotation, 47 and 50 species were found, respectively, in the fields of culture after sugar beets and corn for grain ½ + soybean ½ as forecrops, and 29 species in monoculture. Spring early and late weed plants are represented in the largest number (48.0—65.5%), and the second and third places were respectively occupied by wintering, winter and biennial (24.1—32.0%), and perennial (10.4—21.3%). The main species of weeds in spring barley crops were: Setaria glauca, Echinochloa crus-galli, Chenopodium album, Amaranthus retroflexus, Solanum nigrum, Ambrosia artemisiifolia, Polygonum lapathifolium, Stachys annua, Fallopia convolvulus, Malva neglecta, Polygonum aviculare, Cirsium arvense, Convolvulus arvensis after sugar beets as forecrop; S. glauca, E. crus-galli, C. album, A. retroflexus, S. nigrum, A. artemisiifolia, P. lapathifolium, S. annua, Xanthium strumarium, C. arvense, C. arvensis after corn for grain ½ + soybean ½ as forecrops; S. glauca, E. crus-galli, A. retroflexus, S. nigrum, X. strumarium, Avena fatua, C. arvense, C. arvensis after spring barley as forecrop. In spring barley crops, the largest proportion of dominance and subdominance (in total) was: A. retroflexus (72%) after sugar beets as forecrop; S. nigrum (72%) and C. arvense (71%) after corn for grain ½ + soybean ½ as forecrops; S. glauca (72%) and E. crus-galli (71%) in monoculture. The type of weediness of spring barley crops depended on the forecrop, and the level of weediness depended on the year of research.* ***Conclusions.*** *It was established that in the conditions of the Eastern Forest-Steppe of Ukraine, the forecrop significantly affects the species composition of weeds, their dominant role and the type of weediness of spring barley crops.*

spring barley; weed plants; species composition; forecrops; crop rotation

Common (spring) barley (*Hordeum vulgare* L.) is one of the most important agricultural crops of food and fodder value, which is in great demand in the agricultural market of Ukraine and the world [1]. One of the problems that arises in agricultural production when growing spring barley is increasing the effectiveness of weed control in its crops. The biggest damage caused by weeds is loss of grain yield. The significance of the negative impact on the yield properties of the agrophytocenosis of spring barley starts from the 30th day after the emergence of the crop. The decrease in spring barley productivity at weed density in the range from 75 to 112 pieces./m^2 is from 49 to 62.4% [2]. According to the generalized long-term data of other studies, the presence of 1 kg/ha of raw mass of weeds in spring barley crops causes a shortage of 11.6 kg/ha of crop grain [3]. Certain types of agricultural plants that litter the crops have a significant impact on the yield of spring barley. For example, 10 pieces/m^2 of white mustard (*Sinapis alba* L.) in spring barley crops can reduce the grain yield by 7—14% [4].

In the complex of measures to control the number of weeds, crop rotation plays a primary role, since certain crops can compete well with weeds [5]. Barley is vigorous, having powerful edifying capabilities, from the phase of tillering to earing, it is able to strongly suppress all types of weeds. But later, in the process of grain formation and ripening, the leaves of spring barley plants gradually dry up, and weeds, receiving more light, gradually occupy the resulting ecological niche. In this regard, the most serious competitors of spring barley are dicotyledonous perennial species, mainly rhizome weeds, *Ambrosia artemisiifolia* L. and sunflower windfall (*Helianthus annua* L.) [6]. At the same time, it should be emphasized that spring barley has the ability to suppress the process of generative reproduction

of *Fallopia convolvulus* (L.) A. Love to the greatest extent, compared to other crops [7].

Scientifically substantiated alternation of crops in crop rotation leads to a change in the cenosis of weeds [8]. During the cultivation of spring barley in a short-rotation three-field crop rotation (soybean (*Glycine max* (L.) Merrill.) — spring barley — corn for grain (*Zea mays* L.) of the Right Bank Forest Steppe of Ukraine without mechanical tillage and only direct sowing with the dominant species in its crops were *Chenopodium album* L. (69.3% of the total number of weeds) and *Setaria glauca* (L.) Beauv. (17%), and the subdominant species were *Veronica hederifolia* L. and *Lactuca serriola* L., which made up 5% each. With traditional tillage (plowing to a depth of 20—22 cm), the composition of dominant species was identical to zero tillage, but their share in the total amount of segetal vegetation varied: *C. album* — 54.8%, *S. glauca* — 16.6%. At the same time, there were differences in the species composition of subdominants, where the percentage of *Polygonum convolvulus* L. was 9%, *Amaranthus retroflexus* L. — 8.3% [9].

In the Western Forest-Steppe of Ukraine, when growing crops in crop rotation according to the scheme: peas (*Pisum sativum* L.) — winter wheat (*Triticum* L.) — potatoes (*Solanum tuberosum* L.) — spring barley, in crops of spring barley under the organo-mineral fertilization system the share of dicotyledonous species was 71—72%, among which *Thlaspi arvense* L., *P. convolvulus*, *Galinsoga parviflora* Cav. dominated. Cereal species accounted for 28—29%, among which Echinochloa crus-galli (L.) Roem dominated. et Schult. On the organic background of fertilizer in crops, the share of dicotyledonous weeds was 77—79%, where *Galeopsis tetrahit* L., *C. album*, *G. parviflora*, *Viola arvensis* Murr., *P. convolvulus*, *G. parviflora*, *Stellaria media* (L.) Vill., *Sonchus oleraceus* L. *E. crus-galli* were dominant among cereal weeds [10].

The monitoring of weediness of spring barley crops with subsowing of perennial grasses in the link with the black fallow of grain-beet crop rotation, carried out in the production conditions of the Veselpodilsk Research and Breeding Station of the Institute of Bioenergy Crops and Sugar Beet of the National Academy of Sciences, revealed 13 types of weeds from 10 families. The weedy vegetation of spring barley crops was mainly represented by *A. retroflexus*, *C. album*, *S. glauca*, *E. crus-galli*, *Sonchus arvensis* L. and other types of weeds. Cereal weeds accounted for 58.1% of the total number of all weeds, and dicotyledonous weeds 41.9% [11].

Foreign researchers found that in crops of spring barley under conditions of crop rotation, the number of *Lamium purpureum* L., *Tripleurospermum perforatum* Merat, and *Taraxacum officinale* Web. et Wigg was 13—18% lower compared to monoculture of spring barley. There were more annual broad-leaved weeds in the monoculture of spring barley than in the four-field crop rotation, but less compared to other crop rotations [12].

The forecrop also plays an important role in shaping the level of weediness of spring barley crops [13]. 98 species and 77 genera of weeds were found in the agrophytocenosis of spring barley after peas as a forecrop in the conditions of «Archi» LLC of the Kozyatyn district of the Vinnytsia region [14].

During the cultivation of spring barley after buckwheat (*Fagopyrum esculentum* Moench) on the experimental field of the Kharkiv National Agrarian University named after V.V. Dokuchaev, the main weeds in crops were dicotyledonous short-year species: *A. retroflexus*, *Stachys annua* L., *F. convolvulus*, *A. artemisiifolia*, *C. album* [15—16].

In the fields of the Experimental Base «Alexandria» of the Institute of Plant Protection of the National Academy of Sciences, the weed component of spring barley after soybeans was represented by the dominant species of dicotyledons: *Cirsium setosum* (Will.) Bess., *S. arvensis*, *Convolvulus arvensis* L., *A. retroflexus*, *C. album*, *Oxalis acetosella* L. They met in small numbers *V. arvensis*, *Matricaria perforata* Merat, *G. parviflora*, *Capsella bursa-pastoris* (L.) Medik. and other species. Monocotyledonous species were *S. glauca*, *E. crus-galli*, sometimes *Elytrigia repens* (L.) Nevski [17]. At the experimental field of the Poltava Institute of AIP named after M I. Vavilov, in spring barley crops after soybeans, the most common late spring weed species were *S. glauca*, *A. retroflexus*, *C. album*, which accounted for 76.6—87.8% in the structure of biological groups. At the same time, the share of perennial weeds was 7.3—17.1% (*C. arvensis*, *Cirsium arvense* (L.) Scop.) [18].

According to the data of the Podillia Institute of Forage and Agriculture of the National Academy of Sciences, the species composition of weeds in spring barley crops after sugar beet (*Beta vulgaris* saccharifera L.) consisted of 14 species from 11 families. The most widespread weed species in the crops were: *S. media*, *Galium aparine* L., *Matricaria inodora* L., *C. album*, *A. retroflexus*, *Polygonum lapathifolium* L., *C. arvense*, *S. arvensis*, *S. glauca*, *E. crus-galli* and others [19].

On the experimental fields of grain-row crop rotation of Agricultural close joint-stock company named after Shevchenko of the Trostyanets district of the Sumy region, during the cultivation of spring barley after the stubble forecrop (winter wheat) with the use of an intermediate crop (white mustard), the type of weediness of the crops was characterized as short-year-perennial. More than 80% of the weed group consisted of young species. The weed component of the agrophytocenosis consisted of species of short-year weeds: *E. crus-galli*, *C. bursa-pastoris*, *C. album*, *P. convolvulus*, *G. tetrahit*, *S. media* [20].

In the conditions of the experimental field of the Vinnytsia National Agrarian University, the total number of recorded species in the agrophytocenosis of spring barley varied by forecrops: after sunflower were 30 species; after oil radish (*Raphanus sativus* L. var oleiformis Pars.) were 19 species; after winter wheat were 29; after peas were 23; after soybeans were 26; after corn were 27 species. *C. album* ac-

counted for the largest percentage among the main weed species after winter wheat and pea, and *Setaria viridis* (L.) Beauv. after soybean, corn, sunflower and oil radish. Spring early weeds prevailed after winter wheat and soybeans, 21.6 and 21.1%, respectively. Spring late weeds dominated after oil radish (56.5% of the total number of registered weeds) and corn (55.9%). Rhizome and root-sprouting weeds dominated after sunflower, 7.8 and 14.3%, respectively. Ephemera prevailed after oil radish (10.8%), and winter and wintering after winter wheat (3.0% in total). According to generalized data, the highest indicators of the structure of weed grouping in spring barley crops were recorded after sunflower and corn as forecrops [21].

Summing up the analysis of literary sources, it should be noted that in the conditions of the Eastern Forest-Steppe of Ukraine, the influence of the forecrop on the weediness of spring barley crops in crop rotation and monoculture is insufficiently studied. Our investigations were aimed at solving these pressing issues.

The purpose of the research is to determine the species composition of weeds, their dominant role, and to establish the type and level of weediness of spring barley crops when grown after sugar beet, corn for grain ½ + soybean ½ as forecrops and spring barley in the conditions of the Eastern Forest-Steppe of Ukraine.

Research materials and methods. The investigations were conducted during 2011—17 in a stationary field, fixed nine-course-fallow-grain-row crop rotation at the Department for Plant Production and Cultivar Investigations named after V.Ya. Yuriev of the National Academy of Sciences of Ukraine (black fallow — winter wheat — sugar beets — spring grain ears — peas for grain — winter wheat — corn for grain ½ + soybean ½ — spring grain ears — sunflower) and monoculture of spring barley (control), which are in the Kharkiv region, which is part of the Eastern Forest-Steppe of Ukraine.

Examination of spring barley crops for weediness in the crop rotation after sugar beet and corn for grain ½ + soybean ½ as forecrops and in monoculture of spring barley was carried out in the second half of the growing season of the crop according to the method developed at the V.Ya. Yuriev of the National Academy of Sciences of Ukraine [22]. For each forecrop, a separate form was allocated, in which, after the survey, the identified types of weeds or contaminants (mainly windfall of field crops) were entered. At the same time, both dominant and subdominant species of weed plants were counted. The dominant role of each species was evaluated based on its share in the formation of the total mass of the segetal grouping in the field. Those species whose weight exceeded 10% of the total weight of all weeds were considered dominant, and subdominant, 3—10%.

When determining the name of the type of weediness, the group that was most represented in the total mass of weeds was put on the first place, and on the second or third place, groups of weeds in accordance with their share in the segetal grouping. The level of weediness in each field was determined by the specific share of weeds in the total mass of agrophytocenosis: up to 1% was very weak; 1—5% was weak; 6—15% was average; 16—45% was strong; more than 45% was very strong.

Results and discussion. In spring barley crops during 2011—17 year period, 49 species of weeds and 7 species of contaminants were found (corn, soybean, annual sunflower, seed millet (*Panicum miliaceum* L.), seed buckwheat, seed alfalfa (*Medicago sativa* L.), clover meadow (*Trifolium pretense* L.). All species of plants were divided into three groups: early and late spring; wintering, winter and biennial; perennial. There were assigned 27 species to the group of early and late spring weed plants of: *S. glauca*, *S. viridis*, *E. crus-galli*, *Chenopodium hybridum* L., *C. album*, *A. retroflexus*, *Solanum nigrum* L., *Portulaca oleracea* L., *G. tetrahit*, *Fumaria officinalis* L., *A. artemisiifolia*, *P. lapathifolium*, *Polygonum aviculare* L., *S. annua*, *F. convolvulus*, *Xanthium strumarium* L., *Cyclachaena xanthifolia* (Nutt.) Fresen., *Malva neglecta* Wallr., *Avena fatua* L., *Oxalis corniculata* L., *S. oleraceus*, Abutilon *theophrasti* Medic., corn, soybeans, annual sunflower, seed millet, seed buckwheat.

The group of wintering, winter and biennial weeds includes 17 species: *Lactuca serriola* L., *C. bursa-pastoris*, *Delphinium consolida* L., *G. aparine*, *M. perforata*, *G. parviflora*, *V. arvensis*, *Erigeron canadensis* L., *Crepis tectorum* L., *Melandrium album* (Mill.) Garcke, *Carduus acanthoides* (L.) Pall., *Medicago lupulina* L., *Picris hieracioides* L., *Vicia villosa* Roth., *Conium maculatum* L., *Senecio vernalis* Waldst. et Kit. In addition, ephemeral *S. media* is included in this group of weeds.

The group of perennial weeds was represented by 12 species: *C. arvense*, *S. arvensis*, *C. arvensis*, *Plantago major* L., *Artemisia vulgaris* L., *Ajuga genevensis* L., *T. officinale*, *Euphorbia virgata* Waldst. et Kit., *Linaria vulgaris* Mill., *Achillea millefolium* L., alfalfa seed and meadow clover.

It was established that the quantitative and species composition of weed plants in spring barley crops depended on the forecrop. Under conditions of crop rotation, 47 species of weeds and contaminants were found in spring barley crops after sugar beets (early and late spring were 23 species or 48.9%; wintering, winter and biennial were 14 species or 29.8%; perennial were 10 species or 21.3%), and after corn for grain ½ + soybean ½ were 50 species (early and late spring were 24 species or 48.0%; wintering, winter and biennial were 16 species or 32.0%; perennial were 10 species or 20.0%). During the cultivation of spring barley in monoculture, only 29 species of weed plants were found (early and late spring were 19 species or 65.5%; wintering, winter and biennial were 7 species or 24.1%; perennial were 3 species or 10.4 %). In general, during the period of seven years of research, 18 species and 21 species (or 1.6 and 1.7 times) more weed plants were found, respectively, in the sowing of

spring barley in crop rotation after sugar beets and corn for grain ½ + soybean ½ in monoculture. Among the weed plants, vigorous species prevailed.

It should be noted that the quantitative composition of weed plants in spring barley crops differed depending on the forecrop, but *S. glauca*, *E. crus-galli*, *C. album*, *A. retroflexus*, *S. nigrum*, *P. oleracea*, *G. tetrahit*, *A. artemisiifolia*, *P. lapathifolium*, *S. annua*, *F. convolvulus*, *X. strumarium*, *C. xanthifolia*, *M. neglecta*, *P. aviculare*, *A. fatua*, *S. oleraceus*, *L. serriola*, *C. bursa-pastoris*, *D. consolida*, *G. aparine*, *M. perforata*, *V. arvensis*, *M. album*, *C. arvense*, *S. arvensis*, *C. arvensis*.

In addition to the mentioned species of crops, *O. corniculata*, buckwheat, A. *theophrasti*, *S. media*, *P. major*, *A. millefolium* were weeded after sugar beets; and after corn for grain ½ + soybeans ½, *C. hybridum*, corn, *C. tectorum*, *C. maculatum*, *S. vernalis*, *E. virgata*, *L. vulgaris*.

Compared with other forecrops, *S. viridis*, soybeans were not detected in spring barley crops after sugar beets; and after monoculture of spring barley, *F. officinalis*, annual sunflower, seed millet, *G. parviflora*, *E. canadensis*, *C. acanthoides*, alfalfa hops, *P. hieracioides*, *V. villosa*, *A. vulgaris*, *A. genevensis*, *T. officinale*, alfalfa, meadow clover.

According to the generalized seven-year data, in spring barley sowings in the crop rotation after sugar beets and corn for grain ½ + soybeans ½, the main species of weeds (the proportion of occurrence of the species from 71 to 100%) occupied 27.7 and 22.0% of the total species composition of weeds, respectively, and in monoculture of spring barley 27.6%. The distribution of the main species of weeds by agrobiological groups after sugar beets, corn for grain ½ + soybeans ½ and spring barley (control) was, respectively: early spring, 38.5; 27.3, and 12.5% of the total number of main weeds against the background of the forecrop; late spring, 46.1; 54.5, and 62.5%; perennial root-sprouting, 15.4; 18.2, and 25.0% (Table 1).

It was found that among the main species of weed plants in the spring barley crops, *S. glauca*, *E. crus-galli*, *S. nigrum*, *A. retroflexus*, *C. arvense* and *C. arvensis* occurred after the studied forecrops. Also, in addition to the specified species, the main weeds in the crops were: after sugar beets, *C. album*, *A. artemisiifolia*, *P. lapathifolium*, *S. annua*, *F. convolvulus*, *M. neglecta*, *P. aviculare*; after corn for grain ½ + soybean ½, *C. album*, *A. artemisiifolia*, *P. lapathifolium*, *S. annua*, *X. strumarium*; after monoculture of spring barley, *X. strumarium*, *A. fatua*.

Annually, the main weeds in spring barley crops were: after sugar beets, *S. glauca*, *E. crus-galli*, *C. album*, *A. retroflexus*, *S. nigrum* and *C. arvensis*; after corn for grain ½ + soybeans ½, *S. glauca*, *E. crus-galli*, *S. nigrum*, *C. arvense* and *C. arvensis*.

Among the main weeds, the largest total shares in terms of dominance and subdominance in spring barley crops were found: after sugar beets, *S. glauca* (58%), *A. retroflexus* (72%), *S. nigrum* (43%); after corn for grain ½ + soybean ½, *S. glauca* (57%), *E. crus-galli* (57%), *S. nigrum* (72%), *C. arvense* (71%); after monoculture of spring barley, *S. glauca* (72%), *E. crus-galli* (71%), *C. arvense* (57%).

The ability of *A. fatua* to rapidly spread in spring barley crops in monoculture should be noted separately. In particular, this weed was first discovered in a monoculture of spring barley in 2013 and was classified as a related species (asectators), and starting from 2017, it took one of the dominant positions in crops. On the other hand, *A. fatua* did not

1. Species composition of the main weeds in spring barley crops grown after different forecrops, 2011—2017

Species of weeds	The share of occurrence and dominance of weeds in the segetal grouping after forecrops, %											
	sugar beets				grain corn ½ + soy ½				spring barley			
	d	s	a	Σ	d	s	a	Σ	d	s	a	Σ
Setaria glauca (L.) Beauv.	29	29	42	100	14	43	43	100	43	29	14	86
Echinochloa crus-galli (L.) Roem. et Schult.	–	14	86	100	43	14	43	100	57	14	15	86
Chenopodium album L.	29	–	71	100	29	–	57	86	–	–	–	–
Amaranthus retroflexus L.	43	29	28	100	–	14	57	71	–	14	72	86
Solanum nigrum L.	43	–	57	100	43	29	28	100	–	–	71	71
Ambrosia artemisiifolia L.	–	14	72	86	–	14	57	71	–	–	–	–
Polygonum lapathifolium L.	–	29	42	71	–	–	86	86	–	–	–	–
Stachys annua L.	–	14	57	71	–	–	71	71	–	–	–	–
Fallopia convolvulus (L.) A. Love	–	–	71	71	–	–	–	–	–	–	–	–
Xanthium strumarium L.	–	–	–	–	–	–	71	71	–	–	71	71
Malva neglecta Wallr.	–	–	86	86	–	–	–	–	–	–	–	–
Polygonum aviculare L.	–	–	86	86	–	–	–	–	–	–	–	–
Avena fatua L.	–	–	–	–	–	–	–	–	14	–	57	71
Cirsium arvense (L.) Scop.		14	57	71	14	57	29	100	–	57	14	71
Convolvulus arvensis L.	–	–	100	100	–	–	100	100	–	–	100	100

Note: d — dominant species;
s — subdominant species;
a — asectators (associated species);
Σ — occurrence of a species (sum of d, c, a);
"–" — the species did not have a dominant influence or had a share of occurrence less than 71%

have a similar distribution during the cultivation of spring barley in crop rotation.

In general, during the indicated period of research (Table 2), nine types of weeding were formed in spring barley crops: dicotyledonous short-year, cereal annual-dicotyledonous short-year, dicotyledonous short-year-cereal annual, cereal annual-root-sprouting, cereal annual-dicotyledonous short-year-root-sprouting, dicotyledonous short-year-root-sprouting-cereal annual, dicotyledonous short-year-cereal annual-root-sprouting, cereal annual-root-sprouting-dicotyledonous short-year, root-sprouting-cereal annual-dicotyledonous short-year.

It was established that the types of weediness in spring barley crops differed depending on the forecrop. In the total mass of weeds in crops, after sugar beets, dicotyledonous short-year species were found the most, and the second place was occupied by annual cereal species. In the monoculture of spring barley, cereal annual weeds were in the first place by mass each year, and mostly perennial root-sprouting were in second place. Against the background of the forecrop, corn for grain ½ + soybean ½, the type of weediness was different almost every year.

It was established that the level of weediness of spring barley crops depended less on the forecrop and more on the year of research. Although in the last two years of research (2016 and 2017), the level of weediness was higher when spring barley was grown in a monoculture, compared to when the crop was grown in crop rotation after sugar beets and corn for grain ½ + soybeans ½ (Table 3).

CONCLUSIONS

In the Eastern Forest-Steppe of Ukraine, a total of 56 species of weed plants were found in spring barley crops. During the cultivation of the crop in a stationary field, fixed nine-course-fallow-grain-row crop rotation after sugar beets, 47 species were found (48.9% were early and late spring; 29.8% were wintering, winter and biennial, and 21.3% were perennial); of them, 13 species are classified as the main ones (*Setaria glauca*, *Echinochloa crus-galli*, *Chenopodium album*, *Amaranthus retroflexus*, *Solanum nigrum*, *Ambrosia artemisiifolia*, *Polygonum lapathifolium*, *Stachys annua*, *Fallopia convolvulus*, *Malva neglecta*, *Polygonum aviculare*, *Cirsium arvense*, *Convolvulus arvensis*). 50 species (48.0; 32.0, and 20.0%) were found in spring barley crops in crop rotation after corn for grain ½ + soybean ½, of which 11 species were the main ones (*S. glauca*, *E. crus-galli*, *C. album*, *A. retroflexus*, *S. nigrum*, *A. artemisiifolia*, *P. lapathifolium*, *S. annua*, *Xanthium strumarium*, *C. arvense*, *C. arvensis*). During the cultivation of spring barley in monoculture, 29 species were found (65.5, 24.1, and 10.4%, respectively), of which 8 species are the main ones (*S. glauca*, *E. crus-galli*, *A. retroflexus*, *S. nigrum*, *X. strumarium*, *Avena fatua*, *C. arvense*, *C. arvensis*). After sugar beets, the largest share of dominance and subdominance (total) was recorded in *A. retroflexus* (72%), after corn for grain ½ + soybeans ½, *S. nigrum* (72%) and *C. arvense* (71%), in monoculture, *S. glauca* (72%) and *E. crus-galli* (71%). The type of weediness depended on the forecrop, and the level of weediness depended on the year of research.

Therefore, the weediness of spring barley crops depends on the forecrop, which must be taken into account by agricultural producers in modern crop cultivation technologies. In the future, the influence of different tillage methods and fertilization system on the weediness of spring barley crops in the conditions of the zone should be investigated.

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2. Type of weediness of spring barley crops during cultivation after different forecrops

A year of research	Forecrop		
	sugar beets	grain corn ½ + soy ½	spring barley
2011	Dicotyledonous short-year-cereal annual	Dicotyledonous short-year-cereal annual-root-sprouting	Cereal annual-dicotyledonous short-year
2012	Cereal annual-dicotyledonous short-year -root-sprouting	Cereal annual-root-sprouting-dicotyledonous short-year	Cereal annual-dicotyledonous short-year-root-sprouting
2013	Dicotyledonous short-year-cereal annual	root-sprouting-cereal annual-dicotyledonous short-year	Cereal annual-root-sprouting
2014	Dicotyledonous short-year	Dicotyledonous short-year-cereal annual-root-sprouting	Cereal annual-root-sprouting
2015	Dicotyledonous short-year-cereal annual	Dicotyledonous short-year root-sprouting-cereal annual	Cereal annual-dicotyledonous short-year
2016	Cereal annual-dicotyledonous short-year root-sprouting	Cereal annual-dicotyledonous short-year-root-sprouting	Cereal annual-root-sprouting-dicotyledonous short-year
2017	Dicotyledonous short-year-root-sprouting -cereal annual	Dicotyledonous short-year-cereal annual-root-sprouting	Cereal annual-root-sprouting-dicotyledonous short-year

3. The level of weediness of spring barley crops during cultivation after different forecrops

A year of research	Forecrop		
	sugar beets	grain corn ½ + soybean ½	spring barley
2011	Average	Average	Average
2012	Strong	Average	Average
2013	Average	Average	Average
2014	Weak	Weak	Weak
2015	Weak	Weak	Weak
2016	Strong	Strong	Very strong
2017	Average	Weak	Very strong

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Забур'яненість посівів ячменю ярого залежно від культури-попередника в Східному Лісостепу України

Мета. *Визначити видовий склад бур'янів, їх домінантну роль та встановити тип і рівень забур'яненості посівів ячменю ярого за вирощування після попередників буряки цукрові, кукурудза на зерно ½ + соя ½ та ячмінь ярий в умовах Східного Лісостепу України.* **Методи.** *Дослідження проводили шляхом маршрутних обстежень у польових дослідах, розміщених в стаціонарній дев'ятипільній паро-зерно-просапній сівозміні та в монокультурі ячменю ярого.* **Результати.** *Дослідженнями 2011—2017 рр. у посівах ячменю ярого виявлено 56 видів бур'янових рослин. В умовах сівозміни на полях культури після буряків цукрових і кукурудзи на зерно ½ + сої ½ виявлено відповідно 47 і 50 видів, а в монокультурі — 29 видів. Найбільшою кількістю представлені ярі ранні та пізні бур'янові рослини (48,0—65,5%), а друге і третє місця займали, відповідно, зимуючі, озимі та дворічні (24,1—32,0%) і багаторічні (10,4—21,3%). Основними видами бур'янів у посівах ячменю ярого були: після буряків цукрових — Setaria glauca, Echinochloa crus-galli, Chenopodium album, Amaranthus retroflexus, Solanum nigrum, Ambrosia artemisiifolia, Polygonum lapathifolium, Stachys annua, Fallopia convolvulus, Malva neglecta, Polygonum aviculare, Cirsium arvense, Convolvulus arvensis; після кукурудзи на зерно ½ + сої ½ — S. glauca, E. crus-galli, C. album, A. retroflexus, S. nigrum, A. artemisiifolia, P. lapathifolium, S. annua, Xanthium strumarium, C. arvense, C. arvensis; після ячменю ярого — S. glauca, E. crus-galli, A. retroflexus, S. nigrum, X. strumarium, Avena fatua, C. arvense, C. arvensis. У посівах ячменю ярого найбільша частка домінування і субдомінування (сумарно) була: після буряків цукрових — в A. retroflexus (72%); після кукурудзи на зерно ½ + сої ½ — у S. nigrum (72%) і C. arvense (71%); у монокультурі — S. glauca (72%) та E. crus-galli (71%). Тип забур'яненості посівів ячменю ярого залежав від попередника, а рівень забур'яненості — від року досліджень.* **Висновки**. *Встановлено, що в умовах Східного Лісостепу України культура-попередник суттєво впливає на видовий склад бур'янів, їх домінантну роль та тип забур'яненості посівів ячменю ярого.*

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