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PECULIARITIES OF WEEDS EMERGENCE IN MISCANTHUS CROPS

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Specifics of weeds emergence in miscanthus crops of the first year of growing is investigated. It was established that the miscanthus crops of the second and subsequent years of growing almost did not overgrown with weeds and do not require protective measures.

Miscanthus, weeds, emergence, types of weeds

Introduction. Wild plant species, which are attributed to explerent according to their life strategy, are able to quickly fill the free ecological niches and available in crops almost simultaneously with the emergence of crops, often before emergence on the surface of the soil. Since juvenile - young crop plants are small, they biologically are not able to fill free ecological niches in a short period, leaving free space and other factors ensuring life of plants [1, 2].

The intensity of weeds sprouting in crops is affected by many factors: sufficient amount of heat, required intensity of PAR energy flow, weed seeds stocks in the top soil layer and their structure, sufficient soil moisture [3, 6].

For the human civilization to exist it is necessary to ensure it with available energy An important argument for the development of green energy is that energy crops can grow on marginal soils and on land withdrawn from agricultural production, forming large amount of biomass. That is, they do not create competition for staple food crops [4, 5].

Miscanthus is a perennial cereal crop, which belongs to a group of C_4 plants, its pollen is sterile triploids, therefore propagated vegetatively by roots (rhizomes). Plant of 4 m tall and fluffy inflorescence without seeds contains 64-71% cellulose, 2.2% ash. The plant root system is very extensive, that is why it is possible to grow it on degraded, sandy, loamy soils, on slopes of up to 7°. Miscanthus does not tolerate high acidity and high level groundwater. Long-stable plant can grow in one place for

25 years. It grows slowly during the first year and needs intensive protection from weeds [4,7].

To introduce miscanthus in conditions of Ukraine, comprehensive field researches were carried out between the years 2013-2015. First, it was necessary to get information about the intensity of sprouting weeds in crops first year**.**

Materials and methods. The research was carried out in 2013/2015 in the experimental field Ksaverivka 2. Sowing area was 100 m^2, discount area 50 m^2, replication three times. Experiment was arranged as randomized split lots, replication placing - two tiers.

Record of weeds in miscanthus crops were performed within permanently fixed frames 1.25 x 0.20 = 0.25 m^2 imposed in 4 locations along the diagonal of each variant. Research was carried out in accordance with Methods for Trial and Application of Pesticides [8].

Results. In miscanthus, which is early crop, early spring weed species were recorded first.

At the time of first record (as of 20.04), the number of weed sprouts was 13.2 weed/m^2. The most widespread at that time appeared field penny-cress (*Thlaspi arvense* L), wild mustard (*Sinapis arvensis* L.), fumaria (*Fumaria officinalis* L.), and stickyweed (*Galium aparine* L.) (Table 1.).

Potential reserve of weed seeds in the top soil layer in the fields is large and the amount of weed sprouts is determined by favourable for germination weather conditions. Along with the gradual increase of air and soil temperature, the intensity of sprouting weeds in miscanthus crops increased. Within 10 days (on 30.04) the number of weed sprouts was 28.3 weed/m^2 and more. Apart from early spring weed species, black-bindweed (*Polygonum convolvulus* L.), spotted ladysthumb (*Polygonum lapathifolium* L.), goosefoot (*Chenopodium album* L.), way-grass (*Polygonum aviculare* L.) and others weeds appeared in miscanthus crops.

Over the next 10 days of growing season (as of 10.05) the intensity of sprouting weeds in miscanthus crops increased to the maximum as environmental conditions were quite favourable and crops have not yet developed enough to create

sufficient projective covering of soil surface and significantly reduce PAR intensity. At the time of keeping the records, not only early spring, spring, but also late spring weed species were observed, such as green amaranth (*Amaranthus retroflexus* L.), echinochloa crus-galli (*Echinochloa crusgalli* L.), grey foxtail (*Setaria glauca* L.), black nightshade (*Solanum nigrum* L.).

The amount of weeds fluctuated significantly over the year of research. The smallest number of weeds in miscanthus crops was 13.2 and the highest 33.9 weed/m^2. The most lavish sprouts were of was grey foxtail, echinochloa crus-galli, black-bindweed, spotted ladysthumb and green amaranth.

The intensity of sprouting weeds over the next 10 days (as of 20.05) featured opposite trend of decline. At the optimum weather factors and considerable stocks of weed seeds in the top soil layer, intensity of sprouting decreases. This trend can be explained by the growing role of crops in forming of agrophytocenoses. Young miscanthus plants actively formed leaf apparatus and stems and increased the level of projective shading of soil surface, reducing the light intensity for new weed seedlings that came to the surface and require light energy supply.

At the time of the next records (30.05; 10.06; 20.06) the intensity of sprouting weeds underwent miscanthus crops effect. Miscanthus plants were in the most intensive phases of metabolism and formed maximum size leaf apparatus. It was in this period, that crops were able to more fully absorb solar energy of PAR. In other words, the level of soil surface shading was the most complete.

The evidence of such a powerful influence of dominant miscanthus crops on the other components of agrophytocenoses (weeds) was the intensity of new weeds sprouting as of 20.06. For 10 days (from 10.06 to 20.06), relatively few new weeds sprouted. Among the weed species were goosefeet, grey foxtail, pink thistle and echinochloa crus-galli.

Miscanthus crops showed significantly less impact on the intensity of sprouting of perennials, such as yellow and pink thistles. This biological feature can be explained primarily by the cyclical activity of meristem in perennials during the

growing period, which is the ability of the most intense forming of new sprouts at certain periods of year.

Table 1. Dynamics of weeds sprouting in miscanthus crops (mean of 2013-2015) weed/m^2

Weed specie	Dates of check							Total
	20.04	30.04	10.05	20.05	30.05	10.06	20.06	
Goosefoot	-	1.1	1.6	1.3	0.4	0.2	0.1	4.7
Green amaranth	-	-	2.2	1.8	0.1	-	-	4.1
Echinochloa crus-	-	-	3.4	5.7	6.3	1.4	0.3	17.1
Foxtail gray	-	-	1.9	4.5	7.1	2.3	0.2	16.0
Black-bindweed	-	2.3	3.1	0.4	0.1	-	-	5.9
Spotted thumb	-	1.7	2.7	1.0	0.1	0.2	-	5.7
Field penny-cress	3.2	4.3	1.4	03	0.1	-	-	9.3
Violet wild	1.1	1.8	0.9	0.3	-	-	-	4.1
Fumaria nalis	2.6	2.9	2.1	0.9	-	-	-	8.5
Stickyweed	1.9	2.3	0.6	0.4	-	-	-	5.2
Field mustard	2.7	3.2	2.4	0.5	0.1	-	-	8.9
Black nightshade	-	-	1.1	1.2	0.3	0.1	0.1	2.8
Way-grass	-	1.2	3.1	0.1	-	-	-	4.4
Melandrium n	-	1.3	1.3	0.6	-	-	-	3.2
Yellow thistle	-	0.6	1.1	0.8	0.6	-	0.1	3.1
Pink thistle	-	1.2	1.4	1.1	0.9	-	-	4.6
Fumaria	1.7	4.4	3.6	2.9	2.0	1.4	0.8	16.8

nalis								
Stickyweed	13.2	28.3	33.9	23.8	18.1	5.6	1.6	124.5

Also it can be explained by large reserve of resilient substances in the underground plant part, and significantly less dependence of young sprouts on the capability to replenish both resilient substances and energy for the account of photosynthesis.

Conclusions. It is rightful to generalize that miscanthus being a wide-row crop gradually increased its ability to resist young weeds sprouting of different species, and as of 20 May was able to withstand weeds.

Miscanthus crops of the second and subsequent years of growing almost did not overgrown with weeds and do not require protective measures.

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