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Dla naukowców, wykładowców wyższych uczelni, doktorantów oraz studentów.

Wszelkie prawa do artykułów z konferencji należą do ich autorów.

W artykułach naukowych zachowano oryginalną pisownię.

W przypadku cytowań obowiązkowe jest odniesienie się do zbioru.

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DYNAMICS OF PHYTOMASS PRODUCTIVITY AND SOIL ORGANIC MATTER AT THE DIFFERENT TYPE OF SWITCHGRASS SOWING

As a source of biomass will be good to use a perennial crop which well adapted to the growing region and provide great productivity (yield of plant phytomass). Practical interest has such perennial crops: sugar sorghum (*Sorghum saccharatum* (L.) Moench), miskanthus (*Miscanthus x giganteus* J.M. Greef & Deuter ex Hodk & Renvoize), willow (*Salix viminalis* L.), switchgrass (*Panicum virgatum* L.) at all. [1].

As noted by J. P. Muir at all (2011) switchgrass is the crops with a low cost of cultivation and high productivity of the phytomass, which depends on the elements of cultivation technology [2].

Switchgrass belongs to the cereals. It is thermophilic, perennial crop and grows in natural conditions in North America (45-55°N). Switchgrass is a more plastic plant to the conditions of cultivation amongst energy crops. Switchgrass has a massive vegetative mass and provides productivity in a short period of time (Elbersen W, Kulyk M at all. 2013) [4].

The crop has different colors straight stem which reach 0.5-2.7 m in height, inflorescence (15-50 cm), and great root system which can reach up to 3 m in depth. This plant reproduces by seeds and roots. (Kurylo V. L., Raxmetov D. B., Kulyk M. I. 2018) [3].

The objectives of this study were to evaluate the changes in the structure of the Switchgrass phytocenosis in mixed and stripe crops; productivity of Switchgrass phytocenosis depending on the type of growing and N fertilization (N15, N30, N45, N60); dynamic of soil organic matter as a key indicator of soil quality for the long-term cycle of switchgrass cultivation in stripe, mixed and single-crops.

Single-crop crops (Sw) are crops of one crop with specified row-spacing that forms conditions close to optimal for plant growth and development in phytocenosis.

Stripe crops (Sw|L) are crops of two or more kinds of plants on the one plot of land (field) with proper, beforehand specified alternation of rows or separate bands of crops. In such crops one crop (mainly grain crop) is the main component and another crop (legumes) is a subsidiary one. Seeds are not mixed and sown separately (stripely or by two agrotechnological operations). This method of plant cultivation is used for gaining maximum yield from the area unit with minimal production costs.

Mixed crops (Sw:L) are crops of two or several crops, seeds of which are mixed before planting or perform twice-repeated, independent sowing of crops on the same area. This sowing method is mainly used for growing feed crops to obtain high yield of plant mixture.

Field and laboratory methods were used to determine the interaction between object of research with soil parameters. Visual method was used to assessment of Switchgrass phytocenosis. Gravimetric analysis was used to determine the Switchgrass productivity (Kulyk M., Elbersen W., 2012) [5]. Chemical analysis was used to determine agrochemical soil properties. Mathematical and statistical methods were used to determine the reliability of the results.

The results of the experiment show that in Sw|L with lupine, legume component is supplanted by the main crop (switchgrass) during the fourth vegetation year. This had an impact on the yield of the basic crop within the variables (fig.)

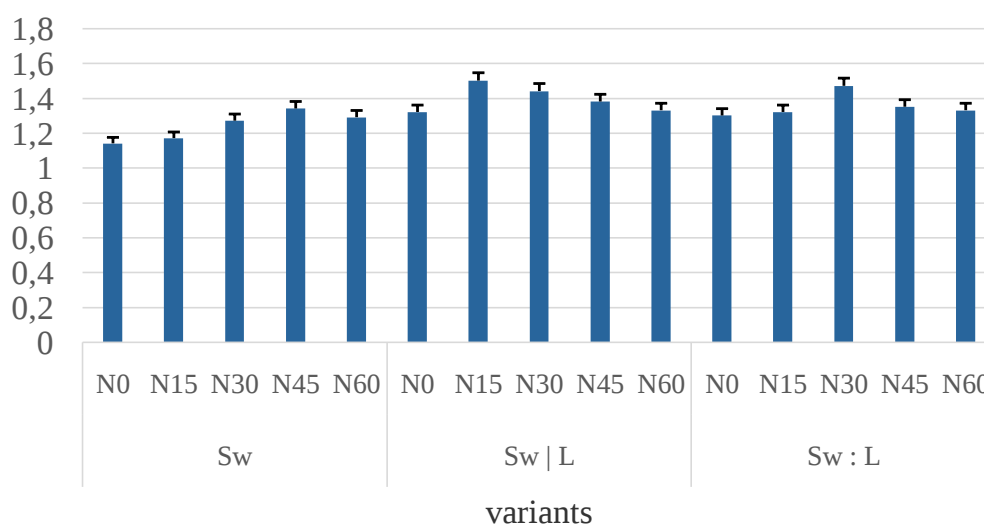


Fig. Switchgrass productivity depending upon growing method and nitrogen application for nutrition, (kg/m²), 2012-2016

Also the results showed increase of average value of organic matter(humus) content in soils under Sw|L – in the range from 3.17 to 3.29 percent, substantially less increase of this index with Sw:L – to 3.26 percent and the least increase with Sw – to 3.24 percent.

This scientific work showed that Switchgrass has a significantly higher productivity in stripe crops with lupine (N15) comparatively with mixed (N30) and single crops (N45). Also research demonstrates the increase of soil organic matter at Switchgrass cultivation in mixed and stripe crops as a result of roots and post harvesting residues accumulation of the bean and cereal component.

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