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STUDY OF SWITCHGRASS VARIETIES IN TERMS OF SEED PRODUCTIVITY

Kulyk Maksym,
Doctor of Agricultural Sciences,
Associate Professor,
Poltava State Agrarian Academy

Rozhko Ilona
graduate student
Poltava State Agrarian Academy

The study of switchgrass varietal samples as a source material for selection is important in terms of obtaining quality seed material and establishing new, highly productive energy plantations in the future [1–5]. Since, reducing Ukraine's energy dependence is an urgent issue today.

Foreign switchgrass varietal samples: Cave-In-Rock, Blackwell, Pathfinder, Carthage, Shelter, Forestburg, Sunburst, Dacotah, Nebraska, Kanlow, Alamo and varieties of Ukrainian selection: Zoriane, Morozko, new Liniia 1307 were studied. Biological and morphological traits as well as seed yield of these varieties were determined according to the methods [6–7] in the central forest-steppe of Ukraine.

The research results show that all switchgrass varietal samples have high drought and frost resistance – from 4–5 points (except for Alamo and Kanlow, their indicator was less than 2 points). All varieties provided high and average lodging resistance – from 3 to 5 points and high resistance to diseases and pests.

According to weight of 1000 seeds, the switchgrass varietal samples have a slight variation depending on the ecological type of variety. This indicator in the group of highland varieties ranged from 1.42 to 1.98 g, and in lowland ecotypes was much smaller and varied in the range from 0.85 to 0.94 g. Varietal samples Cave-in-Rock, Shelter, Pathfinder, Blackwell, Carthage, Zoriane and Liniia 1307 were distinguished according to the elements of crop structure (stalk density and height). The same varieties formed the high biomass yields with different values for seed yield.

The varietal samples were grouped as low-yielding (80–180 kg/ha), medium-yielding (200–300 kg/ha) and high-yielding (more than 300 kg/ha) according to the seed productivity.

According to the coefficient of plant plasticity, the plants of all switchgrass varietal samples are conditionally divided into the following groups:

1). the first group is plants of neutral type, the coefficient of plasticity is close to 1 (0.69–0.96), seed productivity is stable. These are the varieties Cave-in-Rock, Shelter, Carthage, Zoriane and Liniia 1307. Under the unfavorable conditions, their seed productivity decreases to a lesser extent (by $\leq 33.1 \pm 0.2$ kg/ha) compared to the plants of the second group (intensive type);

2). plants of other switchgrass varietal samples (the stability variant goes to zero) ($S^2d \rightarrow 0$), have narrow plasticity and specific adaptability only to the optimal conditions, under which, provide high stable seed productivity (Dakotah, Sunburst, Nebraska, Kanlow and Alamo). However, in the unfavorable weather and climatic conditions or in a low agricultural background, seed productivity decreases sharply. The representatives of this group are demanding to a high level of agricultural technology. Only under these conditions they maximize their biological potential.

Varietal samples Cave-in-Rock, Shelter, Carthage, Zoriane and Liniia 1307 are recommended to be grown in order to expand varietal diversity and obtain yield of dry switchgrass biomass at the level or more than 14.5 t/ha (seed 0.5 t/ha) in the central forest-steppe of Ukraine.

Thus, the cultivation of these switchgrass varietal samples (foreign or Ukrainian selection) will provide considerable amount of seed for establishing new energy crops plantations. This will allow stable obtaining of renewable energy-intensive plant raw materials from energy crops for the production of biofuels, after its energy conversion – cheap energy. Which will reduce the energy dependence of population of the territorial communities, create new jobs and increase people welfare.

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