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BIO PERFORMANCE OF THE VARIETY 'SPERANTA' OF *GALEGA ORIENTALIS*

One of the most important tasks ahead for agriculture worldwide is to secure sufficient food for a growing population without further straining our environmental resources. The challenge is to produce more food with less external input.

The objective of this research was to evaluate biological features, productivity, chemical composition and forage value *Galega orientalis*, variety Speranta.

We could mention that, in the conditions of the Republic of Moldova, *Galega orientalis* seeds require more humidity and higher temperatures of the seedbed in order to germinate in soil in comparison with alfalfa.

Analyzing the results of biological characteristics of growth and development during the 3rd-4th years of vegetation it was established that the plants started growing after wintering in the middle of March. Due to atmospheric precipitation during winter and spring, and the normal moisture content of soil, plants' revival was uniform. From dormant buds situated above the collar, generative shoots developed in early spring and, from the big buds formed at the bottom of the root collar, new underground shoots (suckers) developed, having a hard hood on the tip due to which, shoots penetrate the ground and extend, forming a circle around the mother plant. Subsequently, the secondary root system developed and nodules that associate with nitrogen-fixing bacteria formed on it. Initially, the rosette with leaves developed and, after 10–12 days, shoots started forming. Growth and development of shoots accelerated during April. In the first ten days of May, the flower bud formation of *Galega orientalis* plants started. Plants were harvested for the first mowing in the phase of flower bud formation and a yield of 4.50 kg/m^2 green mass was obtained. It was found that the fodder harvested during this period was characterized by a high content of leaves, but a low content of dry matter.

During the next 14 days, the shoots of *Galega orientalis* plants grew both in height (150–160 cm) and in diameter (0.5–0.7 cm), accumulation of dry matter was increasing, the plants were in the early flowering phase. The fodder was harvested when the plants started flowering and a productivity of 5.85 kg/m^2 green mass or 1.02 kg/m^2 dry matter was obtained.

Galega orientalis regenerated from axillary buds situated on the remaining stem above the ground after harvest and partly from underground buds on the rhizomes, which usually form thinner shoots. It was established that during the 50 days, *Galega orientalis* plants developed shoots that grew about 109 cm tall. After harvesting the fodder at the end of July, 2.00 kg/m^2 green mass or 0.58 kg/m^2 dry

matter were obtained. The natural fodder was richer in leaves and dry matter at the second mowing.

After the second mowing, the revival of plant was quite slow and uneven because of adverse weather conditions (soil and air moisture deficit and high temperatures above 30 °C). The start of growth and development was observed at middle of August and, until the end of vegetation, the formed shoots were semi-erect, thin, with a lot of leaves (66 %) and over 80–87 cm long. The harvested green mass at the third mowing was formed only from shoots developed from lateral buds, so the yield decreased in comparison with the two previous harvests, while the quality of green mass was higher. The fodder yield at the third mowing reached 1.48 kg/m2 green mass or 0.37 kg/m^2 dry matter. The annual fodder productivity reached 79.8 t/ha green mass or 16.2 t/ha dry matter.

Analyzing the biochemical composition of the dry matter from natural fodder, we found that the raw protein content changed depending on the harvesting period, reaching values of 15.42–19.31 %. The fodder harvested at the first mowing, in the phase of flower bud period, and that harvested at the third mowing were distinguished by high raw protein content and, at the same time, by low cellulose content.

The vegetable fats from fodder are the main source of energy for animals because they are necessary for the organism in order to ensure the normal development of vital processes and contribute to the accumulation of fat in milk. It was found that the fodder of *Galega orientalis* had a high fat content. At the second mowing it reached 3.82 % fat in dry matter. A lower amount of fat (2.73 %) was observed at the first mowing, when *Galega orientalis* plants early flowering period.

We may mention that the dry matter from the natural fodder of *Galega orientalis* contained 35.38–39.47 % nitrogen free extractive substances.

The plants were harvested for the first mowing in the flower bud formation period and we obtained 6.3 t/ha nutritive units with 919 kg/ha digestible protein and in the period when plants started flowering – 8.8 t/ha nutritive units with 1216 kg/ha digestible protein; at the second harvest – 5.4 t/ha nutritive units with 697 kg/ha digestible protein, at the third harvest – 3.4 t/ha nutritive units with 560 kg/ha digestible protein, respectively. *Galega orientalis* has a productive potential of 15.1 t/ha nutritive units provided with 2176 kg/ha digestible protein.

Analyzing the biochemical composition of dry matter from the hay of *Galega orientalis* , we may mention that when green mass is drying, the raw protein and fat content is reducing and the cellulose and mineral content is increasing. The biochemical composition of the dry matter from the hay of *Galega orientalis*: 14.35–17.83 % protein, 1.46–2.38 % fats, 32.15–37.58 % cellulose, 36.86–41.65 % nitrogen free extractive substances and 8.48–10.58 % mineral substances.

The content of organic substances and their biochemical composition influence the nutritional and energy value of the hay of *Galega orientalis*. So, 100 kg of hay obtained at the first mowing contain 71 nutritive units, 750 MJ/kg metabolizable energy and 9.39 kg digestible protein, and – at the second mowing – 73 nutritive units, 770 MJ/kg metabolizable energy and 9.16 kg digestible protein. The hay obtained at the third mowing is also characterised by a rather high quality – 74 nutritive units, 793 MJ/kg metabolizable energy and 12.2 kg digestible protein.

The variety Speranta of *Galega orientalis* is characterised by a uniform revival, rapid growth and development that allow to start the first harvest in early May, the yield reaches 45.0 t/ha and when plants start flowering – 58.5 t/ha. *Galega orientalis* plants can be harvested earlier than alfalfa, a fact which will help ensure a regular provision with natural forage.

During the growing season, *Galega orientalis* was harvested three times. Its productivity reached 79.8 t/ha green mass, 15.1 t/ha nutritive units provided with 2176 kg/ha digestible protein.

The green mass of *Galega orientalis* used for preparation of hay, leaves remain on the stem, which helps ensure higher forage value. 100 kg of hay contain 71–74 nutritive units, 750–793 MJ/kg metabolizable energy and 9.16–12.2 kg digestible protein.

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ИНДУЦИРОВАННЫЕ ХЛОРОФИЛЛЬНЫЕ ИЗМЕНЕНИЯ У *LINUM HUMILE* MILL. В ПОКОЛЕНИИ М2

Лен – ценная сельскохозяйственная культура, которую широко используют в промышленности. В последние годы во всем мире возрос интерес к использованию льняного масла в пищу в связи с его лечебными свойствами, обусловленными высоким содержанием линоленовой (35–45 %) кислоты. В связи с этим вопросы по расширению генетического разнообразия льна очень актуальны. Метод экспериментального мутагенеза позволяет за относительно короткий срок создавать новые линии на базе уже изученных сортов. В результате многолетней работы в области экспериментального мутагенеза у пшеницы, ячменя, риса, кукурузы, проса, гороха, подсолнечника, льна и других культур получены мутанты следующих типов: раннеспелые, короткостебельные, с высоким содержанием белка, устойчивые к болезням, с улучшенным составом жирных кислот, а также хлорофиллдефицитные. Ценность хлорофилльных мутаций заключается в том, что по их частоте и спектру судят об эффективности и специфичности действия мутагенов и степени мутабильности сортов.

Объектом исследования служили образцы из генетической коллекции Института масличных культур – два сорта ‘Айсберг’ и ‘Солнечный’ льна масличного *Linum humile* Mill. По триста семян каждого варианта замачивали в 0,05 и 0,5 %-ных водных растворах мутагенов ДГ-2, ДГ-6, ДГ-7, ДГ-9, ДМС и ЭМС. Экспозиция обработки составляла 16 часов. Мутагены серии ДГ являются производными диметилсульфата. Диметилсульфат (ДМС) и этилметансульфонат (ЭМС) – химические мутагены из группы алкилирующих соединений.

Для получения растений поколения М2 семена М1 высевали в открытый грунт питомника. Каждая семья в М2 – это потомство одного растения из М1.