

Structure of Agrophytocenoses of Eastern Goat

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Abstract

The goals and purposes of the study included conducting all phases of field research on the creation of a novel method for weed management in goat's rue herbage that is based on the use of NRS. An arable community is referred to by the biological term "agrophytocenosis." The components of an agrophytocenosis include sowed cultivated plants and satellites, which are species of segetal weeds. These components are linked to the soil by seed banks and banks of vegetative rudiments. When determining an agrophytocenosis, not a particular sowing but rather the complete rotation of crops in a crop rotation within a homogenous region is taken into consideration; if the crop rotation is altered in any way, the agrophytocenosis will also be altered.

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Introduction

Agrophytocenosis has certain characteristics with natural phytocenoses (edaphically driven constancy of plant species) (Burlutskiy et al., 2021), but in general, it is very unlike to natural phytocenoses. Dominants of agrophytocenosis are cultivated plants in terms of composition and population density, and these aspects are directly influenced by man. This does not always derive from ecological principles; rather, the character of the dominant is often determined by the economic climate. In the agrophytocenosis, the processes of ecological niche differentiation are either not expressed at all or are expressed very weakly; as a result, the phytocenotic isolation regime is diminished.

The movement of substances and energy in the system of agrophytocenosis - ecotope is also governed by man, who removes the majority of the plant mass and compensates for the loss of mineral elements by applying fertilizers. Man alters the natural balance of the ecotope (Hong et al., 2004). Because of this, agrophytocenoses are comparable to communities that are in the early phases of succession in terms of the amount of organization they possess (Tokhtar & Zelenkova, 2020). At the moment, studies are being conducted, and promising results have been obtained in the practical application of improving the composition of agrophytocenosis by bestowing heterogeneity features onto agrocoenopopulations (a mixture of varieties, sowing material of different quality). This includes a number of cultivated plants that are distinct from one another in accordance with ecological niches. This contributes to an increased mode of phytocenotic isolation of agrophytocenosis as a result of the selection of cultivated plants with pronounced properties of K-type and S-type strategies. This enables it to be feasible to lower the rates of fertilizers, lime (in acidic soils), and irrigation, in addition to making it possible to regulate the population density of vegetal species without resorting to the use of pesticides. In the process of producing agrophytocenosis, the concept of scheduled succession is also used.

When the yield loss caused by the interception of agricultural resources by them is less than the costs of employing specific control measures, the density of segetal (weedy) species should be kept in the agrophytocenosis below the economic threshold. One of the most important

markers of how helpful the diets of farm animals are is the amount of protein that they contain (Lykkesfeldt & Svendsen, 2007). As a result of its absence, the rate at which young animals develop into adulthood is slowed down, the productivity of adult animals is reduced, and the cost of production per unit rises.

Even in this day and age, the issue of providing sufficient protein for farm animals is still a pressing one. The consumption of high-protein beans ought to play a big part in the resolution of this issue. Feeds created from such plants include a lot of energy, protein, and carotene, are easily consumed by ruminants, and help to a more full expression of the genetic potential of animals (Morais et al., 2020). Additionally, the cost of concentrated feed per unit of output is reduced by using these feeds (Coppock et al., 1981). Recently, a leguminous crop that is not very well known, the eastern goat's rue, is becoming increasingly prevalent in fodder production. This crop is not inferior to other legumes in terms of its chemical makeup or its yield. In addition to this, it is a crop that can be grown for an extended period of time, with its herbage being used anywhere from two to three times longer than clover or alfalfa. The Oriental goat's rue has a reputation for having dependable and consistent seed output, which helps to keep the overall expense of its cultivation in check (Walthall et al., 2013). It also blooms early in the spring

Methods

A new method for the cultivation of eastern goat's rue based on the use of the NRS drug, which reduces the development of foreign flora in crops, will be the focus of the research. This will be done in order to investigate the viability of the method in the conditions of the forest-steppe zone in Northern Kazakhstan. Research scheme: Grass stands with some thawing (I); grass stands with some thawing that have been treated with NRS using a dosage of working solution equal to 2 liters per hectare (II) Representatives of two different life forms and four different ecological groups were found in the agrocenoses of goat's rue that were analyzed for this experiment.

Results and Discussion

The proportion of terophytes was 25.0 percent, and the proportion of hemicryptophytes was 75.0 percent; the proportion of hygromesophytes was 12.5 percent; the proportion of xeromesophytes was 37.5 percent; the proportion of mesophytes was 37.5 percent; and the proportion of mesohygrophytes was 12.5 percent (Table 1). Table 1 presents the species makeup of invasive flora that has become a part of the agrocenosis.

Table 1. Species composition of foreign flora in the structure of agrocenosis

| Views | Lat. name | EG* | WF** |
|-----------------------|-------------------------------------|------|--------|
| Asterisk medium | <i>Stellaria media</i> (L.) Vill. | AHEM | T |
| Wormwood vulgaris | <i>Artemisia vulgaris</i> L. | KM | T |
| Field bindweed | <i>Convolvulus arvensis</i> L. | KM | LEDGER |
| Dandelion officinalis | <i>Taraxacum officinale</i> Wigg. | M | LEDGER |
| Meadow fescue | <i>Festuca pratensis</i> (L.) Huds. | M | LEDGER |
| Bluegrass | <i>Poa trivialis</i> L. | M | LEDGER |
| Quitch | <i>Elytrigia repens</i> (L.) Nevski | KM | LEDGER |
| Foxtail meadow | <i>Alopecurus pratensis</i> L. | MG | LEDGER |

The proportion of groupings of plants belonging to alien flora varied according to the several iterations of the experiment. The proportion of terophytes was 19.9 percent in the herbage that was frozen out in the amount of foreign flora, and the proportion of hemicryptophytes was 80.1

percent. The share of hygromesophytes was 11.5 percent, and the share of xeromesophytes was 51.4 percent. The share of mesophytes was 27.8 percent, and the share of mesohygrophytes was 9.3 percent. The proportion of terophytes was 26.4 percent in the herbage that was frozen and treated with RS in the amount of foreign flora; the proportion of hemicryptophytes was 73.6 percent; the share of hygromesophytes is 15.6 percent; the share of xeromesophytes is 50.6 percent; the share of mesophytes is 25.8 percent; and the share of mesohygrophytes is 8.0 percent (Table 2).

Table 2. The degree of participation of foreign flora in the structure of agrocenosis

| Views | Experience Option | | | |
|-----------------------|------------------------------|---------------------------|------------------------------|---------------------------|
| | I | | II | |
| | Quantity, Pcs/M ² | Share of Participation, % | Quantity, Pcs/M ² | Share of Participation, % |
| Asterisk medium | 7,3±0,85 | 11,5 | 9,8±0,75 | 15,6 |
| Wormwood vulgaris | 5,3±0,85 | 8,4 | 6,8±1,25 | 10,8 |
| Field bindweed | 7,3±1,38 | 11,5 | 5,3±0,63 | 8,4 |
| Dandelion officinalis | 6,3±0,48 | 9,9 | 4,8±0,85 | 7,6 |
| Meadow fescue | 5,3±0,85 | 8,4 | 6,5±0,65 | 10,3 |
| Bluegrass | 6,0±1,23 | 9,5 | 5,0±0,41 | 7,9 |
| Quitch | 20,0±1,83 | 31,5 | 19,8±1,93 | 31,4 |
| Foxtail meadow | 6,0±0,91 | 9,3 | 5,0±0,41 | 8,0 |

The high leafiness of goat's rue, in addition to the fact that one of its biological characteristics is to prevent the leaves from withering, is what draws people to utilize it as hay. Because a considerable percentage of the leafy section of the plant is lost while drying many legumes, which is the part of the plant that contains the majority of the plant's easily accessible nutrients (Nesamvuni et al., 2001). On the other hand, the presence of non-native vegetation may be detrimental to goat's rue crop production, particularly in the early stages of herbage growth. In this context, the investigation of topics about the growth of eastern goat's rue under a variety of circumstances for the creation of cenoses is of interest both from a scientific and a practical perspective

Conclusion

Thus, Oriental goat's rue is a transitional type with secondary ecological-phytocenotic strategies (C-S-R), as evidenced by the ability for vegetative reproduction, the presence of a seed bank, adaptability to adverse climate, demanding soil nutrition. Due to the increase in general competition and differentiation of ecological niches, species of a segetal-ruderal orientation are gradually being replaced by dominant broad-leaved grasses - hemicryptophytes. The use of NRS with a dose of a working solution of 2 l/ha does not have a significant effect on the structure of agrocenoses of herbage culture, therefore it is recommended to use direct preparations for chemical weeding.

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