# THE INFLUENCE OF THE APPLIED MANAGEMENT ON THE PHYTODIVERSITY OF A *Dichanthium ischaemum* (L.) Roberty PERMANENT MEADOW

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**Abstract**

Biodiversity conservation is essential in the fight against climate change. Nothing can reduce global warming or the effects of climate change better than healthy ecosystems. And grasslands have a key role in maintaining the balance of ecosystems because many species live here or are linked to them. The application of organic and mineral fertilizers for extended period of time has determined a high biodiversity of the investigated grassland. The objective of this study was to determine the effect of the applied management on the phytodiversity of a *Dichanthium ischaemum* (L.) Roberty permanent meadow in the Moldovian forest-steppe. The experience field was organized on a permanent grassland of *Dichanthium ischaemum* (L.) Roberty in Andrieşeni locality Iaşi, county framed between the parallels 47°30' 45.2” N and 27°15' 42.0” E. The experimental factors were represented by the harvesting phenophase with three graduations: $a_1$-harvesting at plants height of 15-18 cm, $a_2$-harvesting at the ear formation (control), $a_3$-harvesting to full flowering and fertilization with seven graduations: $b_1$- unfertilized (control), $b_2$- $N_{50}P_{50}$ kg/ha$^{-1}$ annually, $b_3$- $N_{75}P_{75}$ kg/ha$^{-1}$ annually. $b_4$- $N_{100}P_{100}$ kg/ha$^{-1}$ annually, $b_5$-10 Mg·ha$^{-1}$ sheep manure annually, $b_6$-20 Mg·ha$^{-1}$ sheep manure annually and $b_7$- 30 Mg·ha$^{-1}$ applied at two years. The study shows that the applied fertilizers influenced the floristic composition, producing appreciable, quantitative and qualitative changes in the plant cover. The number of species, as well as the variation of the Shannon diversity index, were largely influenced by the amount of mineral N, the amount of manure, but also by the climatic conditions of the experimental period.

**Key words**: permanent grasslands, organic and mineral fertilization, harvesting phenophase, plant diversity

The grassland areas described as green oceans are important for the ecosystem services they provide, with an essential role in the balance of the global ecosystem. Besides the production of animal forage, in the center of current attention is the relationship of meadows with the climate, erosion control and biodiversity. The ability of grasslands to provide multiple ecosystem services depends largely on the intensity of management applied (Vîntu V. *et al*, 2004; Boval M., Dixon R.M., 2012; Goliński P. *et al*, 2012; Avondo M. *et al*, 2013; Duthie D.W., 2015; Iacob T. *et al*, 2015; Smit H.J. *et al*, 2015).

*Dichanthium ischaemum* meadows are widespread in degraded coastal pastures, and on calcareous soils and have a relatively poor phytodiversity, sometimes lacking *Fabaceae*. These meadows are part of Natura 2000 (Ponto-Balkan meadows) of *Dichanthium ischaemum* and *Festuca valesiaca* - R3415). Currently it is essential to identify the sustainable management of the systems and, implicitly, interest from the locals. The *Dichanthium ischaemum* meadow addressed in the study are specific to the steppe and forest-steppe areas, which have recently gained increasing importance in terms of climate change and biodiversity conservation.

*Dichanthium ischaemum* meadows have a wide ecological range and form a derived type of meadows in the steppe, forest-steppe and nemoral areas, where certain species, such as *Festuca valesiaca*, *F. rupicola* and *Agrostis capillaris* lose their dominance, being replaced by *Dichanthium ischaemum*, the cause the main one being excessive grazing. *Dichanthium ischaemum* meadows are generally characterized by a relatively low forest composition, as few species can establish in the areas occupied by the dominant species (Pușcaru-Soroceanu E. *et al*, 1963; Țucra I. *et al*, 1987; Doniță I. *et al*, 2005; Chifu T. *et al*., 2014).

To know to what extent the harvest phenophase, as well as the different fertilizers applied, influence the structure of the meadow experienced by *Dichanthium ischaemum* (L.) Roberty in the period 2018-2022, observations were made regarding the changes in the floristic composition occurring in the experimental plots.

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## MATERIAL AND METHOD

This study presents the results of an experience organized in 2018 on a permanent meadow of *Dichanthium ischaemum* (L.) Roberty. situated in Moldavian forest steppe, on the territory of Andrieşeni locality, Iaşi county, between the geographical coordinates 47°02' N latitude and 27°22' - eastern longitude, on a slightly inclined ground, with SE exposition.

The climatic conditions in the area are characterized by an average temperature of 9.6°C and 517.8 mm of total annual precipitation. Between April and September, the average temperature is 17.3°C, and the precipitation amounts to 337.5 mm.

The experimental factors were represented by the harvesting stage. with three graduations: $a_1$-harvested at plant height of 15-18 cm, $a_2$-harvested at the ear formation (control) and $a_3$-harvested to full flowering and fertilization with seven graduations: $b_1$-unfertilized (control), $b_2$-$N_{50}P_{50}$ kg·ha$^{-1}$ annually, $b_3$-$N_{75}P_{75}$ kg·ha$^{-1}$ annually, $b_4$-$N_{100}P_{100}$ kg·ha$^{-1}$annually, $b_5$-10 Mg·ha$^{-1}$ sheep manure applied annually, $b_6$-20 Mg·ha$^{-1}$ sheep manure applied annually and $b_7$-30 Mg·ha$^{-1}$ sheep manure applied at two years.

Fertilization was done with two types of fertilizer: organic represented by well fermented sheep manure (older than two years) and mineral represented by complex fertilizer with nitrogen and phosphorus ($N_{20}P_{20}$). The manure and mineral fertilizers were manually applied very early in the spring. at the beginning of plant growth.

The administered manure from sheep had the following chemical composition: N-0.692%. $P_2O_5$-0.320% and $K_2O$-0.811%. Fertilizers were applied manually in early spring before the start of active vegetation growth.

Each plot was 4 m × 2.5 m in size. Harvesting was done at earing-flowering stage of the dominant grasses, and the floristic composition was established using the Braun-Blanquet method (Cristea V. *et al*, 2004). For the processing of floristic data, we used the programmes Excel and PC-ORD.

Within the PC-ORD multivariate analysis program (McCune B., Grace J.B., 2002), various methods were used to order the floristic relevés, namely: Summary (to determine the Shannon Index and the number of species), and multidimensional NMDS Autopilot scaling (Păcurar F., Rotar I., 2014).

The statistical data was analyzed by SPSS using ANOVA and the Lowest Significant Difference test (LSD 5%).

## RESULTS AND DISCUSSIONS

Effective management of *Dichanthium* becomes codominant, with a coverage of up to 26.7% in the case of the $a_2b_4$ variant. In 2020, the *ischaemum* meadows requires the adoption of strategies according to local conditions, so as to lead to a rational exploitation and preservation of biodiversity. Thus, a series of integrated management measures are required, taking into account the APIA programs (high natural value meadows HNV) but also the conservation measures established to support the biodiversity of the meadows in the analyzed area.

Analyzing the structure of the permanent meadow of *Dichanthium ischaemum* in the year 2022, it was found that all the fertilizers applied, as well as the harvesting phenophase, influenced the floristic composition, producing appreciable changes, quantitative and qualitative, in relation to the nature and dose of the fertilizer, but also to the climatic conditions of the respective year (*table 1*). In the control variant ($a_2b_1$), in 2020, the degree of vegetation cover was 93%, with a high proportion of the vegetation covered by the *Poaceae* family with a degree of coverage of 75.2%. of which the dominant species *Dichanthium ischaemum* had a high degree of coverage, of 68.3%, being accompanied by the species *Festuca valesiaca* (5.0%) and *Elymus repens* (1.3%).

The presence of *fabaceae* in the vegetal cover was felt in 2020, the weight of the *Fabaceae* family being 3.3%. the most representative species was *Astragalus onobrychis*, accompanied by *Lotus corniculatus* and *Medicago lupulina* (*table 1*). Regarding the degree of participation of plants from other botanical families in the structure of the vegetal cover of the studied meadow, it is found in the variant taken as a control that the share of this group is 14.5%, indicating the high presence of species *Potentilla cinerea* and *Thymus glabrescens*, in the vegetal cover. The floristic diversity of the control variant ($a_2b_1$) consisted in 2020 of a number of 20 species and a value of the Shannon – Wiener diversity index (H') of 1.429, which shows that the phytocenosis of the witness has a low diversity (*table 1*). The harvesting phenophase and the applied fertilization determined significant changes in the structure of the vegetation cover of the *Dichanthium ischaemum* meadow in 2022. Thus, the applied management determined a change in the ratio between the dominant species in the vegetation cover, in the sense that the *Dichanthium ischaemum* species reduced the weight up to 45% in the case of variant ($a_1b_7$) (*table 1*). As the dominant species reduced its degree of coverage as a result of the influence of the studied factors, we note an increase in the share of the *Festuca valesiaca* species in the vegetal cover, which *Fabaceae* changed their degree of participation in the vegetal cover under the influence of the harvest phenophase, but also of the mineral and organic fertilizers applied, increasing their weight in the case of the majority of variants, reaching up to 7.7% in the case of the $a_3b_6$ variant. A high share of legumes of 6.3% was also found in the case of variant ($a_1b_6$) (*table 1*). The reaction of plants from other botanical families to the applied management is also evident in 2023, being differentiated according to the factors studied. their share knowing a significant reduction of up to 9.7% in the case of variant ($a_3b_4$).

Table 1

**The influence of harvesting phenophase and fertilization on the structure and floristic composition of the *Dichanthium ischaemum* (L.) Roberty grassland in 2022**

| Variant | | $b_1$ | $b_2$ | $b_3$ | $b_4$ | $b_5$ | $b_6$ | $b_7$ | *DL 5%* |
|---|---|---|---|---|---|---|---|---|---|
| | | *Average vegetation coverage (%)* | | | | | | | |
| Degree of vegetation coverage (%) | $a_1$ | 94.8 | 95.7 | 96.7* | 92.7 | 92.2 | 97.0* | 94.3 | |
| | $a_2$ | $93.0^{Mt}$ | 96.2* | 96.5* | 97.5* | 91.2 | 96.0* | 96.7* | *2.9* |
| | $a_3$ | 99.3* | 98.3* | 96.6* | 95.3 | 99.3* | 97.0* | 98.3* | |
| *Poaceae* | $a_1$ | 72.7 | 80.0* | 80.7* | 81.0* | 74.3 | 79.0* | 80.0* | |
| | $a_2$ | $75.2^{c}$ | 75.3 | 75.8 | 85.0* | 72.3 | 79.2* | 83.8* | *3.4* |
| | $a_3$ | 82.3* | 78.3 | 77.5 | 82.7* | 77.2 | 77.3 | 80.3* | |
| *Dichanthium ischaemum* (L.) Roberty | $a_1$ | 63.3 | 63.7 | 51.7° | 50.0° | 50.7 | 48.3° | 45.0° | |
| | $a_2$ | $68.3^{c}$ | 65.0 | 50.7° | 47.7° | 57.7° | 53.3° | 47.0° | *13.3* |
| | $a_3$ | 71.3 | 56.3 | 55.0° | 51.0° | 56.7 | 54.7° | 48.3° | |
| *Elymus repens* (L.) Gould | $a_1$ | 3.3 | 6.0* | 5.0* | 5.0* | 5.0* | 5.0* | 9.3* | |
| | $a_2$ | $1.3^{c}$ | 1.7 | 1.7 | 9.0* | 1.7 | 3.0 | 15.7* | *3.2* |
| | $a_3$ | 1.0 | 1.3 | 3.0 | 3.0 | 3.7 | 5.7* | 5.3* | |
| *Festuca valesiaca* Schleich. ex Gaudin | $a_1$ | 5.0 | 10.0 | 22.3* | 25.0* | 18.0* | 24.3* | 24.3* | |
| | $a_2$ | $5.0^{Mt}$ | 7.7 | 21.3* | 26.7* | 12.3 | 19.3* | 18.0* | *12.4* |
| | $a_3$ | 8.7 | 18.7* | 17.0 | 26.3* | 15.0 | 16.0 | 24.0* | |
| *Fabaceae* | $a_1$ | 2.0° | 2.0° | 3.5 | 1.7° | 2.8° | 6.3* | 4.3* | |
| | $a_2$ | $3.3^{c}$ | 4.7 | 3.8* | 1.7° | 3.5 | 4.7* | 3.7* | *0.3* |
| | $a_3$ | 3.3 | 2.5° | 3.8* | 3.0* | 7.7* | 3.8* | 3.3 | |
| *Astragalus onobrychis* L. | $a_1$ | 0.5 | 1.0 | 1.0 | 0.8 | 1.0 | 1.0 | 1.0 | |
| | $a_2$ | 0.8 | 1.0 | 1.3 | 1.0 | 1.0 | 0.8 | 1.3 | |
| | $a_3$ | 0.8 | 1.0 | 1.0 | 0.8 | 4.0 | 0.8 | 1.0 | |
| *Medicago falcata* L. | $a_1$ | 0.2 | 0.2 | 0.3 | | | 1.3 | 0.7 | |
| | $a_2$ | 1.0 | 1.0 | 0.8 | | | 0.3 | 0.3 | |
| | $a_3$ | 0.7 | 0.3 | 0.7 | | 1.0 | 0.2 | 0.5 | |
| | $a_3$ | | | | 0.3 | 0.2 | 0.3 | 0.3 | |
| Forbs | $a_1$ | 20.2* | 13.7° | 12.5° | 10.0° | 15.0 | 11.7° | 10.0° | |
| | $a_2$ | $14.5^{c}$ | 16.2* | 16.8* | 10.8° | 15.3* | 12.2° | 9.2° | *0.7* |
| | $a_3$ | 13.7° | 17.5* | 15.3* | 9.7° | 14.5 | 15.8° | 14.7 | |
| *Achillea millefolium* L. | $a_1$ | 0.8 | 0.5 | 0.5 | 0.7 | 0.8 | 1.0 | 1.0 | |
| | $a_2$ | 0.5 | 0.8 | 1.0 | 1.0 | 1.0 | 0.8 | 1.0 | |
| | $a_3$ | 1.0 | 0.8 | 0.8 | 1.0 | 0.7 | 0.8 | 1.0 | |
| *Potentilla cinerea* Chaix ex Vill. | $a_1$ | 15.3* | 10.0 | 6.7° | 5.0° | 9.0 | 6.0° | 4.0° | |
| | $a_2$ | $10.7^{c}$ | 11.7 | 10.0 | 5.3° | 9.3 | 6.7° | 5.0° | *2.5* |
| | $a_3$ | 9.7 | 12.7 | 10.0 | 5.0° | 6.0° | 8.7 | 5.7° | |
| Gaps % | $a_1$ | 5.2 | 4.3 | 3.3° | 7.3 | 7.8 | 3.0° | 5.7 | |
| | $a_2$ | $7.0^{c}$ | 3.8° | 3.5° | 2.5° | 8.8 | 4.0° | 3.3° | *2.9* |
| | $a_3$ | 0.7° | 1.7° | 3.4° | 4.7 | 0.7° | 3.0° | 1.7° | |
| Number of species | $a_1$ | 18 | 19 | 28* | 19 | 18 | 27* | 32* | |
| | $a_2$ | $20^{c}$ | 25* | 21 | 20 | 20 | 23* | 21 | *3* |
| | $a_3$ | 20 | 24* | 24* | 24* | 32* | 28* | 28* | |
| Shannon-Wiener (H') | $a_1$ | 1.436 | 1.335 | 1.593 | 1.482 | 1.518 | 1.786* | 1.872* | |
| | $a_2$ | $1.429^{c}$ | 1.468 | 1.610 | 1.509 | 1.480 | 1.649* | 1.816* | *0.219* |
| | $a_3$ | 1.242 | 1.537 | 1.613 | 1.533 | 1.643 | 1.706* | 1.774* | |

In 2022, in the phenophase in which the harvest was made at the height of the plants of the dominant species of 15-18 cm, in the unfertilized variant, the value of the Shannon – Wiener diversity index (H') was 1.436, and the number of species was 18, resulting in low diversity (*table 1*). In the variants fertilized with mineral fertilizers, the values of the Shannon – Wiener diversity indices (H') varied between 1.335 and 1.593, indicating a low diversity (*table 1*). In the case of variants fertilized with sheep manure, the values of the Shannon – Wiener diversity index (H') varied between 1.518 and 1.872, depending on the experimental variants, resulting in a low diversity. The number of species in the case of mineral fertilized variants varied between 19 and 28 (*table 1*). In 2022, in the variants in which the harvesting was made at ear formation the dominant species, in the unfertilized variant, the value of the Shannon – Wiener diversity index (H') was 1.429, resulting in a low diversity. The number of species was 20 (*table 1*). In the variants fertilized with mineral fertilizers, the values of the Shannon – Wiener diversity index (H') varied between 1.468 and 1.610, these values expressing a low diversity. The number of species in the case of mineral fertilized variants varied between 20 and 25 (*table 1*). In the case of the variants fertilized with sheep manure, the values of the Shannon – Wiener diversity index (H') varied between 1.480 and 1.816, indicating a low diversity. The number of species in the case of the organically fertilized variants varied between 20 and 21 (*table 1*).

In 2022, in the phenophase in which the harvest was made at full flowering the dominant species, in the unfertilized variant, the value of the Shannon – Wiener diversity index (H') was 1.242, resulting in a low diversity. The number of species was 20 (*table 1*). In the variants fertilized with mineral fertilizers, the values of the Shannon – Wiener diversity index (H') were higher compared to the other experimental variants, varying between 1.533 and 1.613, which expresses a low diversity. In this phenophase, there were 24 species present (*table 1*). In the case of the variants fertilized with sheep manure, the values of the Shannon – Wiener diversity index (H') were higher compared to the other phenophases studied, being between 1.643 and 1.774, indicating a low diversity. The number of species in the case of organically fertilized variants increased, being between 28 and 32 (*table 1*). Analyzing the floristic composition of the *Dichanthium ischaemum* meadow in the harvesting phenophase of the dominant species at the height of 15-18 cm ($a_1$) under the influence of the applied fertilizers (*figure 1*), we observe important changes produced in the fertilized phytocenoses. Thus, according to the ordination graph, the floristic composition of the mineral and organically fertilized variants does not overlap with the control variant (unfertilized), which proves that the similarity between them is low. Also, in the variants in which small doses were applied, respectively $b_2$-$N_{50}P_{50}$ and $b_5$-10 Mg·ha$^{-1}$ sheep manure annually, it is found that the changes recorded in the structure of the vegetal cover were smaller (*figure 1*).

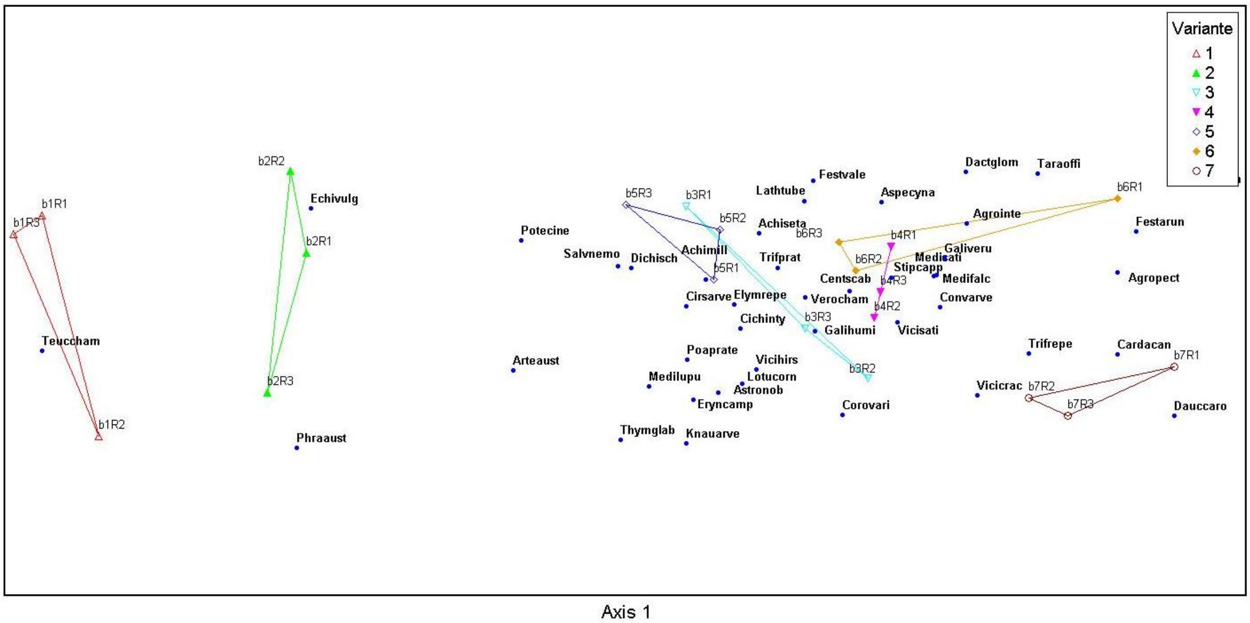


Figure 1 ***Ordination of floristic composition on the Dichanthium ischaemum meadow in 2022, in the phenophase in which the harvesting at plants height of 15-18 cm depending on the fertilizers applied (b$_1$ - unfertilized (control); b$_2$ - $N_{50}P_{50}$; b$_3$ - $N_{75}P_{75}$; b$_4$ - $N_{100}P_{100}$; b$_5$ - 10 Mg·ha$^{-1}$ sheep manure applied annually, b$_6$ - 20 Mg·ha$^{-1}$ sheep manure applied annually and b$_7$ - 30 Mg·ha$^{-1}$ sheep manure applied at 2 years; R$_1$, R$_2$, R$_3$ – replicates)***

(Legend: Species name: *Agropyron intermedium* (Host) P. Beauv. = Agrointe, *Agropyron pectiniforme* Roem. & Schult. = Agropect, *Dactylis glomerata* L. = Dactglom, *Dichanthium ischaemum* (L.) Roberty = Dichisch, *Elymus repens* (L.) Gould. = *Elymrepe*, *Festuca valesiaca* Schleich. ex Gaudin = Festvale, *Festuca arundinacea Schreb.* = Festarun, *Poa pratensis* L. ssp. *pratensis* = Poaprat, *Phragmites australis* (Cav.) Trin. ex Steud. = Phraaust, *Stipa cappilata L. = Stipcapp, Astragalus onobrychis L. = Astronob, Coronilla varia* L. = Corovari, *Lathyrus tuberosus* L. = Lathtube, *Lotus corniculatus* L. = Lotucorn, *Medicago falcata* L. = Medifalc, *M. lupulina* L. = Medilupu, *M. sativa* L. = Medisati, *Ononis arvensis* L. = Ononarve, *Trifolium pratense* L. = Trifprat, *Trifolium repens* L. Trifrepe, *Vicia hirsuta (L.) Gray = Vicihirs, Vicia sativa* L. = Vicisati, *Achillea millefolium* L. = Achimile, *Achillea setacea* Waldst. et Kit. = Achiseta, *Artemisia austriaca* Jacq. = Arteaust, *Asperula cynanchica* L. = Aspecyna, *Carduus acanthoides* L. = Cardacan, *Convolvulus arvensis* L. = Convarve, *Centaurea scabiosa* L. = Centscab, *Cirsium arvense* (L.) Scop. = Cirsarve, *Daucus carota* L. ssp. *carota* = Dauccaro, *Echium vulgare* L. = Echivulg, *Eryngium campestre* L. = Eryncamp, *Galium humifusum* M. Bieb. = Galihumi, *Hieracium bauhinii* Besser = Hierbauh, *Knautia arvensis* L. = Knauarve, *Plantago lanceolata* L. = Planlanc, *Plantago media* L. = Planmedi, *Potentilla cinerea* Chaix ex Vill. = Potecine, *Salvia nemorosa* L. = Salvnemo, *Taraxacum officinale*

Weber. = Tragoffi, *Teucrium chamaedrys* L. = Teuccham, *Tragopogon pratensis* L. ssp. *pratensis* = Tragprat, *Thymus glabrescens* Willd. = Thymglab, *Veronica chamaedrys* L. = Verocham nomenclature after Ciocârlan V., 2009).

In the phenophase in which the harvesting at ear formation the dominant species ($a_2$), the floristic composition showed almost the same tendency as in phenophase $a_1$ (harvested at the height of the plants of the dominant species of 15-18 cm) with some differences: in the case of the variants fertilized with high doses of fertilizers minerals or manure ($b_4$ - $N_{100}P_{100}$ and $b_7$ - 30 $Mg{\cdot}ha^{-1}$ sheep manure applied at 2 years) the ordering of the floristic composition was different compared to the variants in which lower doses of fertilizers were applied. The grouping of species encountered in these variants was slightly different from the homogeneous group of species encountered or existing within the other fertilized variants (*figure 2*).

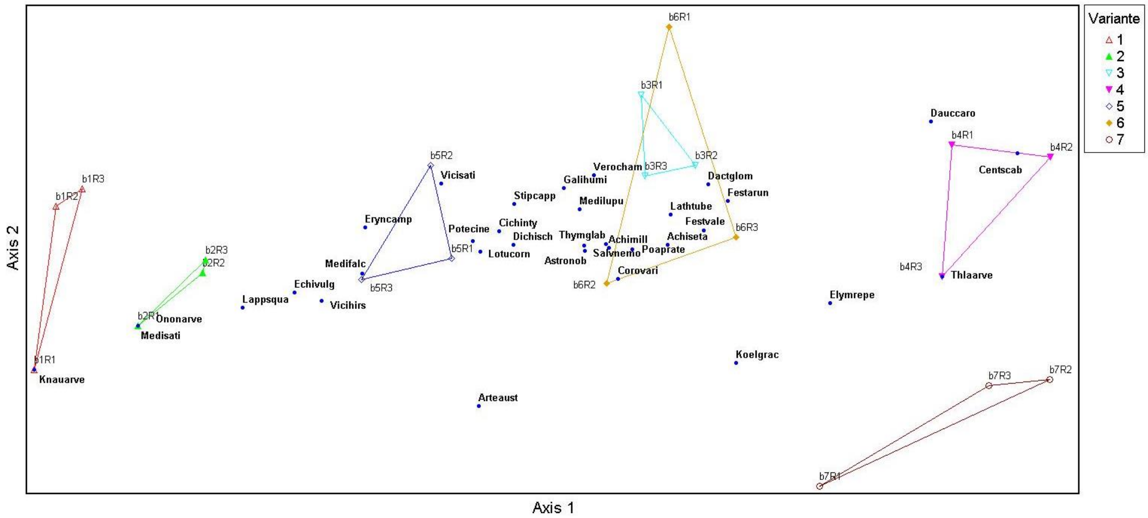


Figure 2 ***Ordination of floristic composition on the Dichanthium ischaemum meadow in 2022, in the phenophase in which the harvesting at ear formation the dominant species depending on the fertilizers applied ($b_1$ - unfertilized (control); $b_2$ - $N_{50}P_{50}$; $b_3$ - $N_{75}P_{75}$; $b_4$ - $N_{100}P_{100}$; $b_5$ - 10 $Mg{\cdot}ha^{-1}$ sheep manure applied annually, $b_6$ - 20 $Mg{\cdot}ha^{-1}$ sheep manure applied annually and $b_7$ - 30 $Mg{\cdot}ha^{-1}$ sheep manure applied at 2 years; $R_1$, $R_2$, $R_3$ – replicates)*** (for species name see the legend from *Figure 1*)

In the case of *harvesting at full flowering the dominant species* ($a_3$), regarding the floristic composition, we observe important changes in the fertilized phytocenoses. Thus, the floristic composition of the unfertilized variant does not overlap with that of the fertilized variants, and the distance between them is large, which proves that the similarity between them is low (*figure 3*).

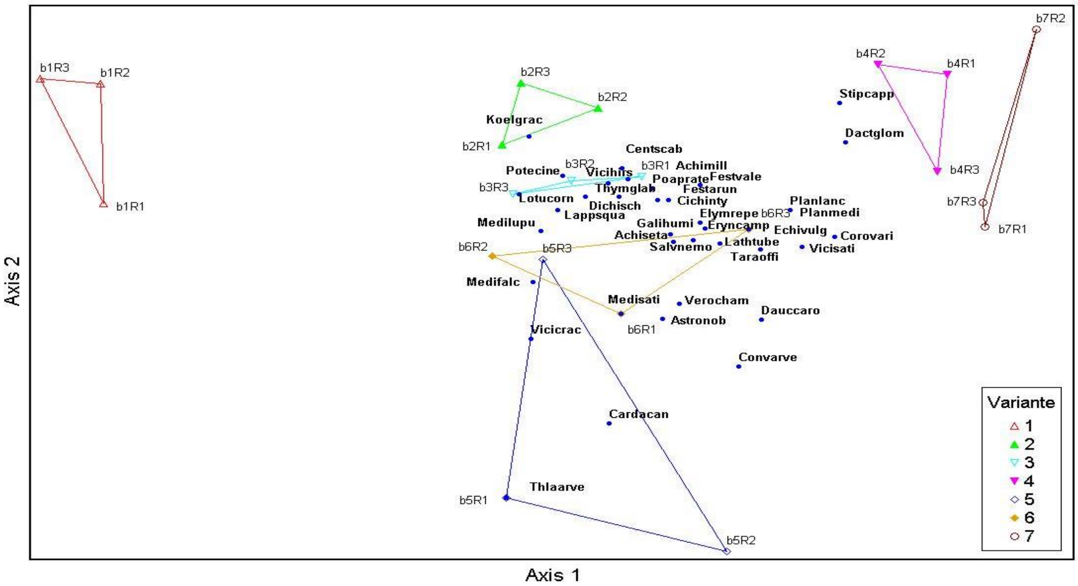


Figure 3 ***Ordination of floristic composition on the Dichanthium ischaemum meadow in 2022, in the phenophase in which the harvesting at full flowering the dominant species depending on the fertilizers applied ($b_1$ - unfertilized (control); $b_2$ - $N_{50}P_{50}$; $b_3$ - $N_{75}P_{75}$; $b_4$ - $N_{100}P_{100}$; $b_5$ - 10 $Mg{\cdot}ha^{-1}$ sheep manure applied annually, $b_6$ - 20 $Mg{\cdot}ha^{-1}$ sheep manure applied annually and $b_7$ - 30 $Mg{\cdot}ha^{-1}$ sheep manure applied at 2 years: $R_1$, $R_2$, $R_3$ – replicates)*** (for species name see the legend from *Figure 1*

Also, with the help of the ordination graph, it emerges that the floristic diversity is the highest when the doses of fertilizers were average. As in the case of the $a_1$ and $a_2$ phenophases, the unfertilized variant, the variants fertilized with ($b_2$ - $N_{50}P_{50}$ and $b_5$-10 $Mg \cdot ha^{-1}$ sheep manure, where the floristic diversity is less, and the variants fertilized with very high doses are separated from the homogeneous group of species large ($b_4$ – $N_{100}P_{100}$ and $b_7$ – 30 $Mg \cdot ha^{-1}$ sheep manure applied at 2 years) (*figure 3*). Thus, applied fertilization, regardless of its nature, favored the development of valuable species in the vegetal cover, changing the physiognomy of the meadow. The results obtained by us during the three experiments can also be found in experiments undertaken at the national and international level, which showed that the intensification of meadows by applying fertilizers favors the establishment of species with high fodder value in the vegetal cover (Rotar I. *et al*, 2003; Samuil C. *et al*, 2008; Vîntu V. *et al*, 2008; Ciobanu C., 2014).

## CONCLUSIONS

From the results obtained during the experimentation on the *Dichanthium ischaemum* meadow it was found that the administration of fertilizers, in any form, causes obvious changes in the structure of phytocenoses compared to the unfertilized variant, but we found that there are also some differences that were determined by the type of fertilizer.

The changes in the floristic composition of the vegetal cover, as well as the variation of the Shannon diversity index, were largely influenced by the amount of mineral N, the amount of manure, but also by the number of years of the fertilization period. As a result of our research it is found that the application of management based on fertilization with moderate amounts of organic and mineral fertilizers can help to preserve the biodiversity of these *Dichanthium ischaemum* meadows, while high amounts of fertilizers disfavor it.

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