Studii și Cercetări Științifice. Biologie 2025, 34 (1), 71-95
Scientific Study & Research. Biology
Print ISSN 1224-919X Online ISSN 2457-5178

POACEAE WITH ECONOMIC AND ECOLOGICAL VALUE IN ROMANIA

Milian GURĂU*

"Vasile Alecsandri" University of Bacău, Faculty of Sciences, Department of Biology,
157 Calea Mărășești Street, 600115, Bacău, Romania

KEYWORDS
Productivity
Uses

ABSTRACT

Poaceae family has 175 species for which we found uses in the works consulted. Only 1 species presents mild toxicity phenomena. In this list there are 116 species with fodder value, 84 decorative, 11 with edible seeds, 12 medicinal, 15 for veterinary medicine, 3 for cosmetics, 6 for biomass, 5 with uses in village households, 1 insecticide, 1 textile and 1 melliferous. In total there are 255 citations for uses. A dendrogram of uses can highlight the finding of new economic values. For the ecological economy we cite the following categories of uses: 53 species for ecological restoration, 37 for phytoremediation, 5 with ecological importance, 24 for vegetation cover and soil protection and 4 bioindicators. In total there are 123 citations for ecological valences.

INTRODUCTION

Over time, grasses have been studied predominantly for their fodder value, rather than for other categories of use. In Romania, plant quality assessments can be found in the works of Kovacs At. (1979), Pop I. (1982), and Marușcă T. (2019). The large number of studies conducted in other countries has motivated us to review our plant lists and take this opportunity to supplement them. Two categories of plants emerge, one with economic and ecological importance, the other with ecological and ornamental importance. Few additions have been made to the plants with economic value. The lists of plant use categories are useful in studies of vegetation, pratology, ecology, environmental protection, phytotherapy etc.

MATERIALS AND METHODS

Only uses of plants that grow in this country were taken from the studied bibliography. A 5-point rating scale is used for fodder plants. Level 1 includes non-fodder and toxic plants, level 2 includes poor fodder plants, level 3 includes plants with medium fodder value, level 4 includes plants with good fodder value, and level 5 includes plants with exceptional fodder value Marușcă T. refined these ratings into a 9-point scale: 1/9 – very poor; 2/9 – poor; 3/9 – poor–average; 4/9 – average; 5/9 – average–good; 6/9 – good; 7/9 – good–very good; 8/9 – very good; 9/9 – excellent. The assessments of edible, medicinal, and decorative plants are more empirical than scientific, but they highlight differences in quality.

RESULTS AND DISCUSSION

The Poaceae family is the richest among the representatives of monocotyledons and is distinguished by its notable ecological and fodder value. Below, we present the list of Poaceae genera and species (Table 1).
The genus *Aegilops* is represented by five species, of which only *A. cylindrica* Host has a sporadic distribution. The other species are rare, possess low fodder value, and their seeds are poorly edible. They exhibit high resistance

* Corresponding author: Gurău M.
E-mail address: milian_gurau@yahoo.com
https://doi.org/10.29081/scsb.2025.34.1.08

to soil moisture deficit and strong insolation, and they serve as effective stabilizers of the soil cover on ruderalized lands.

Aeluropus littoralis (Willd.) Parl. subsp. *littoralis* is fodder, with fast growth and high biomass production (Rezvani M., Zaefarian F., 2011), it has high tolerance to heavy metals and is suitable for oil pollution (Rastgoo L., Alenzadeh A., 2011), it is an indicator of degraded vegetation (Osmonali B. et al., 2024), it is very good for the restoration of sandy (Danin A., 1991) and saline lands.

Agropyron (Elymus) is frequently sown on deforested and polluted lands and it grows better than trees on waste dumps (Gajic G. et al., 2019).

Agropyron cristatum (L.) Gaertn. subsp. *pectinatum* (M. Bieb.) Tzvelev is a frequent species with good fodder value (7/9) and a suitable phytomass utilization index (5/9). It is cultivated in mixtures on arid lands with degraded soils, both in plain and hilly areas (Anghel, Morariu, 1972; Kovacs, 1979; Pop, 1982; Maruşcă, 2008, 2019). The species is highly suitable for ecological restoration through meadow sowing and is effective for the phytoremediation of soils polluted with Cd, Zn, and Cs (Cook et al., 2009; Guo et al., 2014; Meng et al., 2010).

Subsp. *sabulosum* Lavrenko which is rare and vulnerable, from Galați and Vaslui; subsp. *brandzae* (Panțu, Solacolu) Melderis which is rare and endangered; subsp. *prodanii* Ciocarlan which is subendemic.

Aira elegans Schur and *A. caryophyllea* L. have a decorative appearance, they are grasses of intense light, they do not tolerate shading at all, they are very well adapted to severe dryness and extreme nitrogen deficiency. They have very low biomass but we do not have information about their fodder or nutritional value.

The genus *Agrostis* has 8 fodder species of which 2 are rare: *Agrostis alpina* L. and *A. moldavica* Dobrescu & Beldie.

The most widespread is *Agrostis capillaris* L. (Syn. *A. tenuis* Sibith.); subsp. *capillaris* occupies the largest areas in the subcarpathian and lower mountain hill areas, reaches the subalpine, it is a good fodder 7/9, of medium productivity, with useful phytomass 5/9, it has wide ecological plasticity, it develops on soils with very different degrees of fertility, generally poor, specific to mountain soils. Hay production depends on the quality of the soil, 10-15 t/ha green mass on fertile soils and 5.0-7.5 t/ha green mass on poorly fertile and drier soils (Maruşcă T., 2019).

It gives landscapes a brown color and improves their appearance, it is present everywhere in sunny mountain areas, controls erosion, covers and stabilizes soils and it is indicated for ecological rehabilitation works on degraded meadows (Maruşcă T., 2008).

It is indicated for phytostabilization and decontamination of soils polluted with Cd, Pb and Zn (Ebbs S.D. et al., 1997; Lehman C., Rebell Fr., 2004; Truyens S. et al., 2015; Rodriguez-Seiojo A. et al., 2015; Gupta D.K. et al., 2020). It can also decontaminate in smaller quantities soils polluted with Cr, Cu, Sn (Pandey V. C., Maiti D., 2020), poorly tolerates As (Fitz W.J. et al., 2002).

Agrostis stolonifera L. is common in wet and swampy meadows, from the plains to the beech forest level in low mountain areas.

It is a good fodder, 7/9, with high productivity and useful phytomass 6/9 (Maruşcă T., 2019). It has a decorative aspect, it is very resistant to floods but sensitive to drought, it tolerates salty soil (Preda M., 1989; Khan A., Qaiser M., 2006). It colonizes raw alluvium on the edge of flowing waters (Maruşcă T., 2008) and can extract heavy metals such as Ni, Mo, Cr, Cu, Sn (Pandey V.C., Maiti D., 2020).

Agrostis canina L. subsp. *canina,* is frequently spread in swampy meadows, sometimes peaty or sandy, from the sessile level to the spruce level. It is cultivated in the Netherlands (Zeven A.C., de Wet J.M.J., 1975). It has a medium fodder value of 6/9 and a phytomass utilization index of 4/9 (Maruşcă T., 2019). It has good resistance in contaminated mining areas (Fernández S. et al., 2016).

Agrostis gigantea Roth. subsp. *gigantea* (Syn. *A. stolonifera* L. subsp. *gigantea* Rchb.) is sporadic in humid, often marshy areas, it is a good fodder, cultivated in Europe, Asia and North America (Zeven A.C., de Wet J.M J., 1975; Kovacs A., 1979), it is empirically used in Indian veterinary medicine as a fodder for antiallergic effect, in shingles and herpes (Majeed M. et al., 2020).

Agrostis castellana Boiss. & Reut. (*A. moldavica* Dobrescu & Beldie) is rarely spread in swampy meadows on the edges of waters and thickets, it is a good fodder like *A. stolonifera*.

Agrostis alpina L. grows in well-lit places, on skeletal, acidic and moisture-poor soils in meadows, boulder fields and rocks, in the alpine zone, it is rare and under-threat, it has a medium fodder value, 5/9, with a useful phytomass index of 2/9 (Maruşcă T., 2019). It has a decorative appearance (Preda M., 1989).

Agrostis rupestris All. is common in meadows and thickets of Ericaceae, from the alpine and subalpine levels, on skeletal soils, very acidic and extremely poor in nitrogen. It has a medium fodder value, 5/9, very low productivity, and an extremely low useful phytomass, 1/9 (Maruşcă T., 2019). It forms attractive landscapes, it is decorative (Preda M., 1989), it is frost-resistant (Maruşcă T., 2008).

Agrostis vinealis Schreb. (syn. *A. canina* L. subsp. *montana* (Hartm.) Hartm.; *A. coarctata* Hoffm.) is sporadically found on rocks and screes, from the sessile to the subalpine level. It has ecological significance and can serve as fodder for animals.

The species of the genus *Alopecurus* are fodder plants, among which *A. pratensis* L. is widely distributed in meadows with sufficient moisture, sometimes slightly saline, from plains to mountainous areas. It is of very good fodder quality (8/9) with useful phytomass (7/9) (Maruşcă, 2019; Czyż et al., 2011). This species is cultivated on meadows throughout most of Europe, northern Asia, and the Caucasus (Zeven, de Wet, 1975). It is sown on degraded and fragmented meadows and contributes to the restoration of pasture diversity in natural habitats (Maruşcă, 2008; Török et al., 2009).
When cultivated as a decorative plant, *A. pratensis* is slightly invasive but does not significantly alter landscape aesthetics (Preda, 1989; Davidson, Gobin, 1998). It can accumulate Cd, Cu, and Zn (Antoniadis et al., 2021), while showing a low capacity for accumulating radionuclides (Dushenkov, 2003).
Alopecurus pratensis subsp. *laguriformis* (Schur) Tzvelev (*A. laguriformis* Schur) is a very good forage, Carpathian endemic, vulnerable, sporadically spread in subalpine and alpine area.
Alopecurus aequalis Sobol. is a poor-quality fodder species, frequently found in swampy meadows, along watersides, and near springs, from the plain area to the lower mountain level. It has been studied for certain therapeutic properties (Kang et al., 2016). When cultivated as a decorative plant, it is weakly invasive (Davidson & Gobin, 1998).
Alopecurus arundinaceus Poir. is a medium-quality fodder species, sporadically distributed in swampy meadows, sometimes slightly salinized. It has a useful phytomass index of (7/9) (Kovacs, 1979; Pop, 1982; Maruşcă, 2019).
Alopecurus geniculatus L. is an average fodder species (5/9) with a useful phytomass index of 3/9 (Maruşcă, 2019). It occurs sporadically in swampy meadows and water ditches, from the plain area to the lower mountain level (Kovacs, 1979; Pop, 1982; Maruşcă, 2019).
Alopecurus myosuroides Huds. is a weed sporadically distributed in cultivated and ruderal areas. It is difficult to control chemically, and its fodder value is unknown.
Ammophila arenaria (L.) Link. subsp. *arundinacea* H. Lindb. Fil is rare, it grows only on maritime sands, is threatened with extinction. It is very good for ecological restoration, resists at salt and stress (Hesp P.A., 1991), it controls soil erosion and can be used to consolidate sandy lands. Attractive landscapes are obtained (Plants for a Future, 2012–2022; Preda M., 1989).
Anthoxanthum odoratum L. is common in hilly and mountainous areas, it has low productivity, poor to medium fodder value (5/9) with useful phytomass (3/9) (Maruşcă T., 2019) due to toxic substances (Pop I., 1982). It is also used in cosmetics, phytotherapy, as a decorative and in feed mixtures for restoring meadows.
Apera spica-venti (L.) P. Beauv. has a medium fodder value (5/9) and a useful phytomass index of 6/9 (Maruşcă, 2019). It can be utilized in ecological restoration.
Arrhenatherum elatius (L.) J. Presl produces a large amount of phytomass and has very good fodder quality (8/9) as well as a high useful phytomass index (8/9) (Maruşcă, 2019). It is decorative and slightly invasive (Davidson & Gobin, 1998) and can be sown on degraded meadows to increase biomass production (Maruşcă T., 2008). The species is effective for the phytoextraction of heavy metals such as Pb, Zn, and Cd (Teodoro et al., 2019; Antoniadis et al., 2021) and acts as a pioneer in vegetation establishment on tailings dumps (Gajić et al., 2019).
Avena, Wild Oat, does not have the qualities of cultivated oat, the seeds are of poorer quality, they are fodder, also the young plants are fodder. It is combated as a weed; the straw has the same uses.
Avena barbata Pott ex Link is rare, can be found only in Vaslui and Constanța, it is considered toxic by some authors (Kovacs At., 1979; Pop I., 1982), however with edible seeds 2/5, the straw used for biomass, mulch and paper (Plants for a Future, 2012–2022; Keshkin M., et al, 2024).
Avena fatua L. is common in ruderal areas and cultivated lands. Its seeds are edible (2/5) and have diuretic and emollient effects (Plants for a Future, 2012–2022; Keshkin et al., 2024). Some Romanian authors considered it toxic (Kovacs, 1979; Pop, 1982), but it can serve as fodder in early growth stages.
Avena sterilis L. subsp. *ludoviciana* (Durien) Gillet & Magne is a sporadic weed found in cereal crops. Its seeds are moderately edible (3/5), and its straw can be used for biomass, mulch, and paper production (Plants for a Future, 2012–2022; Keshkin et al., 2024). The species is decorative (Preda, 1989), slightly toxic (Kovacs, 1979; Pop, 1982), and is used in Indian veterinary ethnomedicine as feed for diarrhea, dyspepsia, and gastrointestinal disorders (Majeed et al., 2020).
Beckmannia eruciformis (L.) Host. is good fodder (7/9), with a lot of useful phytomass 8/9 (Maruşcă T., 2019), edible seed 2/5; it can also be used for animal bedding, pillow filling (Plants for a Future, 2012–2022), decorative.
Brachypodium pinnatum (L.) P. Beauv. and *B. sylvaticum* (Huds.) P. Beauv. are present in hilly and submontane areas, they have a medium fodder value of 5/9, with a useful phytomass of 7/9 (Maruşcă T., 2019), they are decorative. *B. pinnatum* (L.) P. Beauv. develops in open places, on drier and poorer nitrogen soils which it protects (Török P. et al., 2019), *B. sylvaticum* (Huds.) P. Beauv. covers the ground very well in shaded decorative spaces (Preda M., 1989; Oakes A. J., 1990).
Briza media L. is common on nutrient-poor soils in hilly and mountain meadows, it has poor productivity, in the growth phase it has a medium fodder value, after seed ripening it has a poor fodder value (Kovacs A., 1979; Pop I., 1982). It is rich in coumarins and flavonoids during the flowering period, it also has decorative value in rock

gardens, and it requires minimal maintenance (Preda M., 1989; Oakes A.J., 1990; Davidson C.G., Gobin S.M., 1998).

The species of the genus *Bromus* are weeds, many of them are adventiv in Romania, most of them have low economic value. Among them, *Bromus inermis* Leyss is the most appreciated species of this genus, it is cultivated in various places in Europe; in Romania it has very high productivity, very good fodder value (8/9), useful phytomass 8/9 (Maruşcă T., 2019). As a decorative plant it is suitable for cultivation because it has an invasive character (Davidson C.G., Gobin S.M., 1998). The roots grow quickly, it is very resistant to drought and frost, it is valuable for ecological reconstruction in arid regions, it is a very good fixer of land subject to erosion, it protects dry and semi-dry soils, it is cultivated in mixtures, in vineyards it stabilizes the soil on the sloping side of vineyard terraces and provides good quality hay, in lucerne it strongly competes with weeds and restores the quality of hay (Maruşcă T., 2008; Török P. et al., 2009; Dudău A.M. et al., 2023). It is suitable for phytostabilization, it accumulates very well Pb, As, Cr, Ni, smaller amounts of Cd and Zn (Turnau K. et al., 2010; Antoniadis V. et al., 2021).

Bromus erectus Huds. (including *Bromus arvensis* Lam.) is frequently found in ruderal areas and occasionally in crops, from the plain to the beech zone. It has medium fodder value (6/9) and useful phytomass (6/9) (Kovacs, 1979; Pop, 1982; Maruşcă, 2019) and contributes to the protection of dry and semi-dry soils (Török et al., 2019).

Bromus hordeaceus L. is a pioneer species that protects sandy, sandy-loamy, and pebble soils.

Bromus japonicus Thunb. is frequently spread, it is resistant to moisture and nitrogen deficiency, the leaves and seeds have poor fodder and edible value (Kovacs A., 1979). For phytoremediation it is susceptible to decontamination in small quantities of polycyclic aromatic hydrocarbons (Hong S.H. et al., 2009).

Bromus ramosus Huds. is a poor fodder (Kovacs A., 1979; Pop I., 1982), it is common in forests and thickets, in hilly areas.

Bromus squarrosus L. is common in plains and hills and has an invasive character. It acts as a pioneer on sandy soils and has medium fodder value (5/9) with a low useful phytomass index (2/9). For phytoremediation, it is known to extract small amounts of Cd from contaminated soils (Hesami et al., 2017), Cs (Cook et al., 2009), and oil pollutants (Hatami et al., 2018).

Bromus sterilis L., is invasive, it protects the soil, as fodder it can only be used before flowering.

Bromus tectorum L., is common in sandy, dry, ruderal places, it has an invasive character, it stabilizes sands, it is good for soil protection.

Taxons with insignificant economic value are: *B. commutatus* Schrad., that is common in ruderal places from the steppe to the beech level, it has economic value and it is not used in Romania. *B. racemosus* has an uncertain presence in Romania but is known as a poor fodder (5/9), with useful phytomass 7/9 (Maruşcă T., 2019). *B. rigidus* Roth. is rare, it is mentioned only from the Port of Constanta, it may have some uses (Eduard E.T., 1986; Plants for a Future, 2012–2022; Keshkin M. et al, 2024). *B. scoparius* L. end *B. rigens* L. it is rare from the forest-steppe, on very dry soils which it protects, it may have some uses (Keshkin M. et al, 2024). *B. secalinus* L. was cultivated as fodder in the past in Europe but now it is a weed, it has decorative value like *B. inermis* (Zeven A.C., de Wet J.M., 1975).

The genus *Calamagrostis* has 7 species; at 5 of them we have information about their ecological value, they are good soil protectors, they have a decorative appearance and they do not have fodder value.

Calamagrostis arundinacea (L.) Roth. is common in hilly and mountainous areas, it has a large volume of underground and aerial plant mass, it has high productivity but low fodder value (Fiala K. et al., 1989; Maruşcă T., 2008; 2019). It is competitive, it has an invasive character, it easily multiplies by rhizomes, it is a pioneer of vegetation, it is very good for ecological reconstruction and good for phytoremediation of tailings dumps in mining areas contaminated with Mn, Cu, Pb, Cd. Pb, As (Antosiewicz D.M., et al., 2008). It is decorative on heavy soils in swamps, around ponds and lakes where it also has an anti-erosion role (Oakes A.J., 1990).

Calamagrostis canescens (Weber) Roth. is decorative on heavy soils in swamps, around ponds and lakes where it also has an anti-erosion role (Preda M., 1989; Oakes A.J., 1990).

Calamagrostis epigejos (L.) Roth., is harmful to the grassy carpet in meadows exploited for animal husbandry, it has no useful phytomass (Maruşcă T., 2019), it is fodder with medium value for goats, only in the growth phase (Hajnaczki et al., 2021). It is invasive, it is frequently monodominant in the grassy carpet, it has a decorative appearance and it is cultivated in some countries (Preda M., 1989; Oakes A.J., 1990; Davidson C.G., Gobin S.M., 1998; Khanbabyeva O.E. et al., 2021).

It is good for ecological reconstruction, it protects eroded soils in forest clearings and meadows. It is also very good for restoring ecosystems that are destroyed by pollution because it is competitive (Regvar M. et al. 2006). It can be cultivated near metal smelters for Cd phytoremediation (Lehman C., Rebell F., 2004), it participates in the formation of humus on tailings dumps from thermal plants (Djurdjević L. et al., 2005), it colonizes on ash deposits (Gajic G. et al., 2019).

Calamagrostis pseudophragmites (Haller fil.) Koeler is frequent on the water's edge from the plain to the subalpine level, it tolerates salty soil (Khan A., Qaiser M., 2006), it stabilizes alluvial deposits.

Calamagrostis villosa (Chaix.) J. F. Gmel., is sporadically present in the spruce to subalpine forest level, it has a large volume of roots and it has an anti-erosion role in mountainous areas (Fiala K. et al., 1989), it is decorative (Preda M., 1989).
Catabrosa aquatica (L.) P. Beauv. is sporadic in swamps and near springs, from the steppe zone to the beech level, it has a medium fodder value (5/9), with a useful phytomass of 5/9 (Kovacs A., 1979; Maruşcă T., 2019), it can be used for ecological restoration in wetlands (Fernandez-Garciá, Perez F.J., 2016). The plant decoction and seeds have very poor quality; they were not used by Romanians.
Chloris barbata (L.) Sw. It is adventive in the Flora of Romania, was found in the Port of Constanta, it is empirically used in Indian veterinary medicine in the form of a decoction for diarrhea, dyspepsia and inflammation (Majeed M. et al., 2020).
Chrysopogon gryllus (L.) Trin. has nutritious seeds known to Turks and Italians. In the early growth phase it has a medium fodder value of 4/9, with good useful phytomass 7/9 (Maruşcă T., 2019) but is combated in fodder crops (Maruşcă T., 2008). It is dye (Pop I., 1982), on the meadows with degraded slopes it has value for ecological and decorative reconstruction.
Corynephorus canescens (L.) P. Beauv., is rarely spread on sandy soils in forest-steppe areas where it covers and protects the soil (Török P., et al., 2019).
Cynodon dactylon (L.) Pers. has a low fodder value (6/9), with a useful phytomass of 2/9 (Maruşcă T., 2019) but with a beneficial effect on animals suffering from bronchiectasis, chronic intestinal catarrh, nephropathies (Pârvu C., 2005). It is used in Indian veterinary ethnomedicine, in the form of paste or juice, it is appreciated in anemia, and also it has effects in the treatment of wounds, cuts, dysentery (Majeed M., et al., 2020).
In human medicine, it has various phytotherapeutic uses similar to remedies with general action.
It is a pioneer species of vegetation on bare and sandy areas, it fixes the soil, it can be successfully used in ecological restoration (M. Răvăruţ, 1972; Pârvu C., 2001), it tolerates high temperatures, floods, drought, toxic metals (Gupta D. K., et al., 2020). It grasses the soil contaminated with heavy metals and various amendments. It covers and protects meadows on degraded, semi-arid and sometimes saline soils (Schkla S. K., 2011). It is indicative and tolerant on meadows degraded by overgrazing (Török P., et al., 2009). It supports salty soil and it is good for restoring saline lands (Pasternak D., Nerd A., 1995; Khan A. et Qaiser M., 2006), it is a fixed dune species (Lemauviel S., Rose F., 2003).
Through phytostabilization, it can increase soil pH values (Yang et al., 2016). It provides moderate to low decontamination of soils polluted with Ni, Mo, Cr, Sn, Se, As, Mn, Zn, Co, Cu, Pb, and Cd (Gautam & Agrawal, 2019; Sarma, 2011; Pandey & Maiti, 2020; Fitz et al., 2002). However, it is destroyed on soils contaminated with polycyclic aromatic hydrocarbons and Cd (Song et al., 2022).
Cynosurus cristatus L. is common on fertile and relatively nutrient-rich soils, from hill and mountain meadows to subalpine level, it has medium productivityand good fodder value (7/9), it has useful phytomass 4/9 (Maruşcă T., 2019), it has also decorative appearance (Preda M., 1989).
Cynosurus echinatus L. is a fodder plant sporadically sprerad in plains and hills.
Dactylis glomerata L. is spontaneous and frequently cultivated in many countries, it has high productivity and excellent fodder value (9/9), with useful phytomass 8/9 (Maruşcă T., 2019; Zeven A. C., de Wet J. M. J., 1975). In Indian veterinary ethnomedicine it is administered in the form of leaf extract for diuretic and anti-inflammatory and it is also useful for herpes (Majeed M., et al., 2020). It is decorative and slightly invasive (Preda M., 1989; Davidson C. G., Gobin S. M., 1998). It is cultivated in soil bioengineering works, on dry and eroded slopes from plains to mountains to stabilize slopes affected by landslides, it contributes to controlling erosion, to covering and conserving the soil (Maruşcă T., 2008; Giupponi L. et Leoni V., 2020). It tolerates heavy metals from contaminated soils but can no longer be used as fodder.
Dactylis glomerata subsp. *lobata* (Drejer) H. Lindb *(D.polygama* Horv.) is sporadic in hill and submontane forests, it has good fodder value 7/9, useful phytomass 7/9.
Danthonia alpina Vest. is sporadic, it has medium fodder value (5/9), with useful phytomass 4/9. *D. decumbens* (L.) DC. is frequent but it is average fodder (4/9), with useful phytomass 3/9 (Maruşcă T., 2019); both protect dry and semi-dry soils (Török P., et al., 2019).
Dasypyrum villosum (L.) P. Candargy is sporadic in the plain and hill areas, it is drought-resistant, it is of scientific interest.
Deschampsia caespitosa (L.) P. Beauv. is common in heavily degraded mountain meadows with acidic soils, high trampling, and high humidity. It has high productivity but is harmful to the grassy carpet and has little useful phytomass (Maruşcă, 2019). When dry, it acquires a yellowish-brown color, is decorative, and shows a weak invasive character (Davidson & Gobin, 1998). On sites contaminated with heavy metals, it is effective in eliminating Zn (Korzeniowska & Stanisławska-Glubiak, 2023) and tolerates As and Pb (Fitz et al., 2002). It is rich in indigestible fibers and represents a potential biomass source.
Deschampsia flexuosa (L.) Trin. has low productivity, average value (4/9), with useful phytomass only 3/9 (Maruşcă T., 2019), it is decorative and weakly invasive (Davidson C. G., Gobin S. M., 1998).

Digitaria ciliaris (Retz.) Koeler, is an annual weed, rare, in crops and fallows, ornamental as a lawn (Jones E. A. L., et al., 2021), tolerates salty soil (Khan A., Qaiser M., 2006), stabilizes mobile dunes (Zuo X., et al., 2008), susceptible to decontamination in small amounts of HAP (Hong S. H., et al., 2009).
Digitaria ischaemum (Schreb.) Muhl. is sporadic in cultivated and ruderal places, from forest-steppe and the sessile level, it tolerates and accumulates small amounts of Mg, Pb, Cd, Mn, Cu (Gautam M., Agrawal M., 2019), tolerates also salty soil (Khan A., Qaiser M., 2006).
Digitaria sanguinalis (L.) Scop is an annual weed, common in cultivated and ruderal places in the forest-steppe and the sessile level, it is overwhelming for the grassy carpet in meadows, it has no useful phytomass (Maruşcă T., 2019), it has poorly edible seeds (2/5) (Keskin M., et al., 2024), it has anti-inflammatory, antifungal, antimutagenic properties (Kampriya M. K., et al., 2021). It is good for the decontamination of Cd, Cr, Cu, Pb, Zn (Wang X., Liu Z., 2013).
Echinochloa crus-galli (L.) P. Beauv. is a weed that causes problems on moist-wet agricultural lands, it has medium fodder value (5/9), good useful phytomass, 7/9 (Maruşcă T., 2019), moderately edible seeds 3/5 (Keskin M., et al., 2024), is suitable for phytoremediation of wastewater sludge (Almasi A., et al., 2021), it tolerates salty soil, it has a decorative appearance (Davidson C. G. , Gobin S. M., 1998). In Indian veterinary ethnomedicine, the juice of the plant is administered to treat animals with digestive disorders, it has a demulcent effect (Majeed M., et al., 2020).
Elymus species are suitable for cultivation and as decorative plants, they have a slightly invasive character and they do not disappear over the years (Davidson C. G., Gobin S. M., 1998).
Elymus elongatus (Host) Runemark recovers alkaline and secondarily saline soils. It is good for energy crops and for phytoremediation purposes, it accumulates and tolerates Pb, Ni, Zn (Sipos G., et al., 2013), it has high sensitivity to Cu and Cd, (Gajic G., et al., 2019), it produces 2-15 t/Ha phytomass that can be used to obtain methyl alcohol (Boros-Lajszner E., et al., 2020).
Elymus farctus subsp. bessarabicus (Săvul. Rayss.) Melderis is a species of mobile dunes (Lemauviel S., Rose F., 2003), it is rare in Romania, it grows on sands in Constanța, subsp. *farctus* has ecological and decorative value (Oakes A. J., 1990).
Thinopyrum intermedium (Host) Barkworth & D. R. Dewey (Syn. *Agropyron intermedium* (Host) P. Beauv.; *Elymus hispidus* (Opiz.) Melderis; *Leymus hispidus* (Opiz.) Tzvelev) has a very poor productivity (Czyz H. et al., 2011); in the growth stage it has a medium fodder value of 5/9 and a good phytomass utilization index of 7/9 (Maruşcă T., 2019). It is medicinal, the roots have a diuretic effect (Sezik E., et al., 2000). It protects dry and semi-dry soils (Török P., et al., 2019). It is suitable for phytostabilization of heavy metals Pb, Zn, etc. (Turnau K., et al., 2010).
Elymus repens (L.) Gould is a weed that causes problems in agriculture, with a good fodder value of 6/9 if it is harvested in the growth phase and a good useful phytomass index of 7/9 (Maruşcă T., 2019). For animals it is good for nephropathies and bronchiectasis (Pârvu C., 2001) The leaves and very young shoots are edible 2/5. As a medicinal plant, it is appreciated with medium effect, 3/5, contains antioxidant substances, it is frequently used for the excretory system, in colds, detoxification, hepato-biliary problems, etc. In cosmetics it is used as a skin maintenance agent for oily skin, it is antifungal, moisturizing and emollient (Ionescu-Călineşti Larisa, 2009).
It fixes sands and poorly fertile lands on slopes. It supports soil contaminated with Pb.
In Romania there are 3 species of *Eragrostis*, very resistant to drought, they can also grow on sandy soils which they stabilize. E. *minor* Host. has a frequent spread, the others are sporadic. They are short plants of a glaucous color, they have a decorative appearance, they are also called Gray Grass. In these plants have been found antioxidant and neuroprotective substances. The seeds contain nutrients (Sun Nu C., et al., 2018; Keskin M., et al., 2024).
E. pilosa (L.) P. Beauv. is widespread in the same habitats, it was sometimes found on salty soils, it is used to heal bruises (Plants for a Future, 2012–2022). The seeds are edible, they contain proteins, carbohydrates, mineral salts, fats (Tooqeer S., et al., 2018; Keskin M., et al., 2024).
Plants of this genus are used in ethnoveterinary medicine in Pakistan. *E. minor* is administered as fodder or juice, it is appreciated as an anti-inflammatory in digestive disorders. With *E. pilosa* administered as a paste or decoction it is used to treat animals with dysentery. *E. cilianensis* is administered as juice or fodder to treat digestive disorders, allergies, herpes, malaria (Majeed M., et al., 2020).
The genus *Festuca* is represented by numerous species; among the good fodder and frequently spread ones there are *F. rubra* L., *F. nigrescens* Lam., *F. pratensis* Huds., *F. drymeja* (Mert & W. D. J. Koch) Holub., *F. heterophylla* Lam., *F. arundinacea* Schreb. și *F. gigantea* (L.) Vill.
Festuca rubra L. subsp. *rubra* is common in mountain meadows, it has high productivity, good fodder value (7/9), with useful phytomass 6/9 (Maruşcă T., 2019; Czyz H. et al., 2011). It is cultivated in many countries as pasture grass (Zeven A. C. et de Wet J. M. J., 1975). It is cultivated as a decorative plant in mixtures for mowed lawns, it is weakly invasive and forms a well-closed grassy blanket.
It is highly suitable for the ecological restoration of degraded meadows, exhibiting high ecological plasticity. It tolerates nutrient deficiency, high temperatures, floods, drought, very low temperatures, grazing, and toxic metals.

The species stabilizes slopes prone to landslides in soil bioengineering projects. It is cultivated in fodder mixtures in meadows, hill, and mountain areas up to 1,200 m altitude (Maruşcă, 2008; Gupta et al., 2020; Giupponi & Leoni, 2020).
Numerous studies state that it is good for phytoremediation, it decontaminates soils polluted with As, Cu, Mn, Zn Cd, Ni and hydrocarbons (Gajić G., et al., 2016; Korzeniowska J., et Stanislawska-Glubiak G., 2023; Pandey V. C. et Maiti D., 2020). It increases soil pH (Yang et al., 2016).
Festuca nigrescens Lam. is a good fodder, frequently spread in spruce and subalpine levels (Kovacs Att., 1979; Pop I., 1982; Maruşcă T., et al., 2009).
Festuca pratensis Huds. subsp. *pratensis,* subsp. *apenina* (De Not.) Hegi, has high productivity, producing up to 10 t green mass/ha, with excellent fodder value (9/9) and useful phytomass 8/9 (Maruşcă T., 2019; Nazăre A. I., Ţîţei V., 2025).
It is cultivated for ecological restoration, in fodder mixtures, on meadows, wet hills, up to low mountain areas. It is sensitive to drought (Maruşcă T., 2008). In soil bioengineering works it controls erosion, stabilizes slopes subject to landslides (Giupponi L. et Leoni V., 2020). It is frequently cultivated as a decorative plant on roadsides, near buildings, sports facilities, etc., it is resistant to major pollutants (Nefed'eva E. E. , et al., 2020) but performs a weak decontamination of Zn Cd, Ni, Pb, creosote (Korzeniowska J. et Stanislawska-Glubiak G., 2023; Pandey V. C. et Maiti D., 2020).
Festuca arundinacea Schreb. has high productivity, very good fodder value 8/9, with excellent useful phytomass (9/9) (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019). It was introduced in the USA on a large scale (Zeven A. C. et de Wet J. M. J., 1975). For ecological restoration, it is cultivated on meadows, wet hills to mountains area, it is resistant to grazing, sensitive to drought (Maruşcă T., 2008).
Numerous authors state that it is good for eliminating Pb, Zn, Cd, Ni, As, degraded hydrocarbons (Soleimani M. et al., 2009; Steliga T. et Klika D., 2020; Hong S. H., et al., 2009; Khashij Sh., et al., 2018; Luo J., et al., 2020; Pandey V. C., Maiti D., 2020). The quality of the soil from hay harvested from polluted environments must be known very well. It is also decorative (Preda M., 1989).
Festuca drymeja (Mert & W. D. J. Koch) Holub is common in some beech forests, it is good fodder for deer, wild boars and cattle, the seeds are poorly edible.
Festuca heterophylla Lam. is a good fodder (7/9), with a useful phytomass of 7/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019).
Festuca gigantea (L.) Vill. is studied for hybridization with other fodder species to increase productivity, it is also fodder for game animals.
Festuca altissima All. can be fodder for hunted game. Among the common species but of poor fodder quality there are: *Festuca valesiaca* Schleich. ex Gaudin, *Festuca stricta* Host. subsp. *sulcata* (Hack.) Patzke ex Joch Müll, *F. ovina* L. end *Festuca supina* Schur.
Festuca valesiaca Schleich. ex Gaudin has low productivity and poor to medium fodder value (5/9), with useful phytomass 3/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2008, 2019). Meadows that are dominated by this grassland produce up to 5.7 t green mass/ha but with numerous species without fodder value (Nazăre A. I., Ţîţei V., 2025). It is resistant to drought and grazing, it protects the soil on degraded lands, it is very good for restoring alfalfa because it strongly competes with weeds (Török P., et al., 2009).
Festuca stricta Host. subsp. *sulcata* (Hack.) Patzke ex Joch Müll is common; subsp. *rumelica* Foggi et Petrova is sporadic and endemic in the Romanian Carpathians. It has low productivity and average fodder value (5/9), with useful phytomass 5/9. It dries out during the summer. The meadows dominated by this grass contain numerous non-fodder species, they have 3.6-6 t /ha green mass and 0.4-0.6 UVM. In degraded meadows it stabilizes soils on slopes subject to soil erosion It is very good for restoring alfalfa because it strongly competes with weeds (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2008; Török P., et al., 2009).
Festuca ovina L. is a poor fodder (5/9), with useful phytomass 4/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019), it protects dry and semi-dry soils (Török P., et al., 2019); subsp. *airoides* (Lam.) O. Bolòs is good for the ecological reconstruction of degraded meadows, with very acidic soil in the mountain pines level, it has low productivity, medium fodder value (5/9), with useful phytomass 2/9, resistant to frost and overgrazing (Maruşcă T., 2008; 2019).
It is decorative (Preda M., 1989; Khanbabyeva O. E. , et al., 2021).
Festuca supina Schur. (*Festuca ovina* L. subsp. *sudetica* (Kittel) Hayek.) is a poor fodder (Kovacs At., 1979; Pop I., 1982), frequent in subalpine and alpine meadows, it has a decorative appearance (Davidson C. G. et Gobin S. M., 1998).
Rare and threatened species: *Festuca amethystina* L., subsp. *amethistina, F. bekeri* (Hack.) Trautv., *F. callieri* (Hack. ex St.-Yves) Markgr., *F. carpatica* F. Dietr., *F. nitida* Kit. subsp. *flaccida* (Schur) Markgr., *F. vaginata* Walst et Kit. ex Willd., *F. versicolor* Tausch.
Festuca amethystina L., subsp. *amethistina* is a average fodder 5/9, with a useful phytomass of 5/9 (Kovacs Att., 1979; Pop I., 1982; Maruşcă T., 2019), decorative and slightly invasive (Davidson C. G., Gobin S. M., 1998)., subsp. *orientalis* Krajina is under threat (Oprea Ad., 2005).

Festuca bekeri (Hack.) Trautv. from steppe and forest-steppe sands. Rare subsp. *polesiaca* covers and protects the soil (Török P., et al., 2019)
Festuca callieri (Hack. Ex St.-Yves) Markgr. is rare, under threat, with medium fodder value, 5/9 and very low useful phytomass 2/9 (Kovacs Att., 1979; Pop I., 1982; Maruşcă T., 2019).
Festuca carpatica F. Dietr., Carpathian endemism, under-threat, it has sporadic distribution (Oprea Ad., 2005), good – very good fodder value 7/9, with useful phytomass 5/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019).
Festuca nitida Kit. ex Schult subsp. *flaccida* (Schur) Markgr. (Syn. *F. violacea* Schleich. ex Gaudin) has rare, sporadic distribution in subalpine and alpine levels, it is a poor fodder (Kovacs At., 1979; Pop I., 1982).
Festuca vaginata Walst & Kit. ex Willd. is a average – good fodder (5/9), with useful phytomass 4/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019), it covers and protects the soil (Török P., et al., 2019), it is rare and under threat.
Festuca versicolor Tausch subsp. *vesicolor* is common in the alpine and subalpine levels, it has a medium fodder value (5/9), with useful phytomass 3/9 (Maruşcă T., 2019); subsp. *dominii* Krajin is rare, endemic to the Romanian Carpathians, under threat.
Other fodder plants with sporadic distribution and poor fodder value are: *Festuca filiformis* Pourr., *F. pallens* Host. subsp. *palens*, *F. panciciana* (Hack.) K. Richt end *F. picturata* Pils.
The genus *Glyceria* is represented by 6 marsh species that are not appreciated at all as fodder plants because they also contain toxic substances (Pop I., 1982); their seeds have poor edible value. They have ecological importance.
Glyceria arundinacea Kunth. may have ecological and energetic value comparable to *G. maxima*. In North America and some European countries, it is valued as an ornamental plant, an excellent filter for polluted water, and a very good erosion control agent. It attracts fauna.
Glyceria maxima (Hartm.) Holmb. is common in humid habitats in plains and hills areas where it is not very invasive, it is harmful to the grasslands on the meadows; in the green state, before flowering, it is little consumed by cattle, if they do not find other plants, it is poor to medium fodder (4/9); with sufficient useful phytomass 7/9 (Ghişa E., 1972; Kovacs At., 1979; Zanoschi V. et al., 1981; Maruşcă T., 2019). It is suitable for cultivation as a decorative plant, it has an invasive character and forms perennial vegetation (Oakes A. J., 1990; Davidson C. G. et Gobin S. M., 1998). For phytoremediation it is useful because it has excessive growth (Khanbabyeva O. E., et al., 2021). It can be a source of biogas from wet plants whose energy value is medium (Roj-Rojewski S., et al., 2019).
*Glyceria fluitan*s (L.) R. Br., has poorly edible seeds 2/5 (Plants for a Future, 2012–2022), it decontaminates wetlands in mining areas polluted with Zn and Pb (McCabe O. M., et al., 2000). It is decorative along watercourses (Oakes A. J., 1990).
Glyceria notata (Chevall.) Chevall. it is widely spread, it has very poorly edible seeds 1/5 (Plants for a Future, 2012–2022).
Glyceria nemoralis (R. Uechtr.) R. Uechtr. et Körn. has sporadic distribution, it is toxic (Pop I., 1982).
G. declinata Breb. can be used like *G. fluitans*.
The genus *Helictochloa* (syn. *Helictotrichon*; *Avenula*) includes perennial grasses rich in fiber. They have little fodder importance, as only young inflorescences are consumed, but they are good soil protectors and have decorative value.
Helictochloa compressa (Heuff.) Romero Zarco (syn. *Avenula compressa* (Heuff.) W. Sauer & Chmel.) is a poor-quality fodder species (Pop, 1982).
Helictochloa planiculmis (Schrad.) Romero Zarco (syn. *Avenula planiculmis* (Schrad.) W. Sauer & Chmel.) and *Helictochloa praeusta* (Rchb.) Romero Zarco (syn. *Avenula praeusta* (Rchb.) Holub) are decorative species that protect the soil. They expand due to low competition but remain insignificant as biomass sources.
Helictochloa pratensis (L.) Romero Zarco (syn. *Avenula pratensis* (L.) Dumort.; *Helictotrichon pratense* (L.) Besser) has medium fodder value (6/9) and a useful phytomass index of 5/9 during the growth phase (Kovacs, 1979; Maruşcă, 2019).
Helictochloa versicolor (Vill.) Romero Zarco (syn. *Avenula versicolor* (Vill.) M. Lainz) is sporadic in alpine meadows and Ericaceae thickets, with an average fodder value of 5/9 and very low useful phytomass (2/9) (Maruşcă, 2019).
Avenula pubescens (Hudson) Dumort. (syn. *Helictotrichon pubescens* (Hudson) Pilg. subsp. *pubescens*) is decorative and protects dry and semi-dry soils (Oakes, 1990; Török et al., 2019). Subsp. *laevigata* (Schur) Holub (syn. *Helictotrichon laevigatum* Schur) is rare and occurs in meadows, subalpine, and alpine rocks.
Hierochloë australis (Schrad.) Roem. et Schult. It is spread sporadically, it has decorative value (Davidson C. G. et Gobin S. M., 1998).
Hierochloë repens (Host.) P. Beauv. it is spread sporadically in plain and hilly areas, it has aromatic seeds, with poorly edible antioxidant substances (2/5), used in the food industry as a flavor in sweets and soft drinks, flavor for tobacco, braids for aromatic baskets (Pop I., 1982; Zainuddin A., et al., 2002; Torbjøn A., 2015). As a fragrant grass it is decorative and it is maintained in culture as a weakly invasive plant (Oakes A. J., 1990; Davidson C. G., Gobin S. M., 1998). It is of interest for medicine, insecticidal treatments and household utilities (Plants for a

Future, 2012–2022). In ecological reconstruction works it is used to stabilize banks because it has a strong root system.

Holcus lanatus L. is common in wet meadows in the Subcarpathian hills and the lower mountain floor, it has medium productivity, good fodder value (6/9) and useful phytomass 6/9 (Maruşcă T., 2019), sometimes it is grown for hay. It is decorative due to its silver-green color (Khanbabyeva O. E., et al., 2021). It colonizes coal dumps in drier mining areas and grasses the soil contaminated with heavy metals and various substances. Through phytostabilization it raises the pH values (Yang et al., 2016). It participates in the decontamination of soils polluted with Hg and As (Fernández S., et al., 2016; Fitz W. J., et al., 2002; Lewińska K., 2012).

Holcus mollis L. is sporadic, fodder, cultivated as an ornamental on moderately acidic soil (Oakes A. J., 1990).

Hordelymus europaeus (L.) Harz it is a shade species, frequent in rarefied areas and forest edges, from the sessile oak to the beech levels that could be introduced into culture as a fodder plant.

The genus *Hordeum* includes species resistant to overgrazing from ruderal, sunny, dry, low-altitude areas, which cover the ground well after serious destruction of species diversity. The most widespread is *H. murinum*. These plants have medium foddr value before flowering. Their seeds are of very poor quality. Heavy metal and oil pollution does not dry them out.

Hordeum bulbosum L. is rare and under-threat, a fodder plant with medium value (5/9) with useful phytomass 7/9 (Maruşcă T., 2019).

Hordeum geniculatum All. tolerates well salty soil, it is an indicator of meadows degraded by overgrazing (Török P., et al., 2009).

Hordeum jubatum L. grows in wet, salty meadows, it is rare in Romania, in other areas of the world it is considered a pioneer of vegetation, it has poor fodder value, it is decorative, tolerates hydrocarbons, it is mentioned in phytoremediation works (Davidson C. G. et Gobin S. M., 1998; Pandey V. C. et Maiti D., 2020; Robson D. B., et al., 2004).

Hordeum marinum Huds is sporadic in ruderal and salty meadows of steppe and forest-steppe, it is good for grassing salty lands, it is a toxic fodder on polluted soils with Cd (Rhini N., et al., 2024).

Hordeum murinum Huds. subsp. *murinum* is common and does not cause damage through invasion. Subsp. *leporinum* (Link.) Arcang. is rare, with medium fodder value (5/9), useful phytomass (7/9) (Maruşcă, 2019), and poorly edible seeds (2/5). A decoction of the plant has beneficial effects for bladder disorders (Keskin et al., 2024; Plants for a Future, 2012–2022). It tolerates Cd (Arduini et al., 2015), is resistant to diesel pollution, and can serve as an indicator species for bioremediation (Popoviciu et al., 2016).

Leersia oryzoides (L.) Sw. is common on the banks of the rivers in the plains and hills areas, it can remove pesticides (Syranidon Ev., et al., 2016) and As (Pandey V. C., Maiti D., 2020). It can be cultivated as a decorative together with species of *Carex* and *Scirpus* in decorative gardens on marshy lands, also for controlling the erosion and the formation of the soil. Dried flower bouquets can be made from inflorescences (Oakes A. J., 1990).

Leymus racemosus (Lam.) Tzvelev subsp. *sabulosus* (M. Bieb.) Tzvelev is rare and under-threat, subendemic, from the degraded lands of the Romanian coast, decorative with its silver-green color, it is good for grassing salty maritime sands. In meadows exploited in pastoral regime it is harmful, competitive and without useful phytomass (Preda M., 1989; Maruşcă T., 2019; Osmonali B., et al., 2024). The leaves are rich in textile fibers, they can be used to make braids (Plants for a Future, 2012–2022).

Lolium sp. resists very well at grazing and trampling, it is frequently cultivated on polluted lands that are devoid of vegetation.

Lolium perenne L. has high productivity, very good fodder value before fruiting (9/9), with high useful phytomass 8/9, it is good for ecological restoration on meadows and hills with sufficient moisture, it is sensitive to frost and dryness (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2008, 2019); for lawns it is grown in mixtures with other grasses. It germinates waste dumps in mining areas, it is tolerant to heavy metals (Gajic G., et al., 2019), can be planted on soils from metallurgical factories contaminated with Pb, Zn, Cu (Arienza m., et al., 2003), it raises soil pH values (Yang et al., 2016), it behaves differently towards heavy metals in the soil, it is good for Cd, Zn, Hg (Korzeniowska J., Stanislawska- Glubiak G., 2023; Pandey V. C. & Maiti D., 2020; Leuda A. M., et al., 2020). It has been rarely used in folk medicine as an antirheumatic and for inflammation (Crăciun Fl., et al., 1977; El Beyrouthy M., et al., 2008).

Lolium temulentum L. can be used for phytoremediation of Cd, Pb, Cr, Cu, Sn, atarazine, anthracene (Pandey V. C. et Maiti D., 2020) but Cd strongly stresses them and depresses their growth (Marzben L., et al., 2017).

Melica species are present in scrublands, sparse forests and meadows; when they are planted in dense groups they are decorative, they have very low phytomass and become ineffective if used as fodder, source of substances or phytoremediation.

Melica altissima L. is decorative in arboretums (Oakes A. J., 1990).

Melica ciliata L. is a poor -average fodder 4/9, with very low useful phytomass 2/9 (Maruşcă T., 2019), it is cultivated for decoration in dense groups of plants in the shade (Oakes A. J., 1990).

Melica nutans L. possible to be fodder for deer but also it contains toxic substances (Pop I., 1982; Paszkiewicz-Jasińska A., et al., 2023), it accumulates Cd, Pb, Ni, Zn from tailings dumps (Stefanovicz A. M., et al., 2016; Bierza K., 2022).
Melica uniflora Retz. is an indicator species of natural forest areas. It exhibits antibacterial and antioxidant activity and has been studied for the production of natural preservatives, cosmetics, and pharmaceutical applications (Çil et al., 2021). It is considered good fodder for deer, with high quality before flowering (4/5) and medium quality after flowering (3/5). However, it is not recommended for cultivation, as other fodder species are more suitable (Paszkiewicz-Jasińska et al., 2023). As a decorative plant, it can be used as a lawn replacement (Oakes, 1990).
Melica transsilvanica Schur suitable for phytostabilization of Pb, Zn, etc. (Turnau K., et al., 2010).
Milium effusum L. is a shade plant, commonly spread from plains to mountains levels, which can be cultivated as a decorative plant, it is used as ground cover and for vegetation maintenance in rocky places (Oakes A. J., 1990; Burri K., et al., 2009), it has poor fodder value, the straws are rich in cellulose, they can also be used for handicraft weaving; some authors in the past claimed that it would have toxic substances for animals, the seeds are poorly edible (2/5), they can be administered mixed with flour (Pop I., 1982).
Molinia caerulea (L.) Moench. has medium productivity, it is harmful to the grassy carpet, it does not have useful fodder phytomass (Maruşcă T., 2019). For ecological restoration works, it is decorative on wet, peaty, acidic soils (Davidson C. G., Gobin S.M., 1998; Oakes A. J., 1990), it has an invasive character (Galvánek D., et al., 2015), it resists at soil pollution with Zn, Cd, Pb, from mining and metallurgical waste dumps (Pietrykowsky M., et al., 2018).
Nardus stricta L. has high productivity but has no fodder value at all. It is harmful to the grassy carpet and does not contain useful phytomass. It grows unhindered on pastures in the mountain area, severely degraded by overgrazing. On eroded and overgrazed lands, it is a very good soil layer stabilizer, prevents erosion, and provides a pleasant appearance to severely damaged ecosystems.
Oreochloa disticha (Wulfen) Link. is widespread in alpine meadows, under threat, average fodder (4/9) and with low useful phytomass (Maruşcă T., 2019), decorative (Preda M., 1989), with possibilities for phytoremediation of polluted soils (Regvar M., 2006).
Parapholis incurva (L.) C. E. Hubb. is rare on salinized sands at Razelm-Sinoe, it tolerates salty soil (Ajmal K. & Qaiser M., 2006).
Phalaroides arundinacea (L.) Rauschert has very high productivity, biomass of 8-20 t/ha, good fodder value (7/9), with useful phytomass 9/9 (Maruşcă T., 2019; Plants for a Future, 2012–2022). It is introduced into the hay crop in some countries, the seeds are easily shaken and are difficult to harvest.
It is an anti-erosion plant in North America (Kim J., et al., 2020) used in the USA, China, India, probably in other countries for phytoremediation by bioaccumulation (Deng H., et al., 2004), it is good for biomonitoring of heavy metals, it accumulates low amounts of Zn, Cu, Cd, Pb (Friioff A., et al., 2005; Rahman M. A. et Hasegawa H., 2011). The contaminated hay can be used as a source of biofuel for the grass pellet and briquette industry (Wrobel C., et al., 2009). It has medium value as a source of biogas from wet plants (Roj-Rojewski S., et al., 2019). It is attractive as a decorative plant, it covers the ground well, is highly invasive (Oakes A. J., 1990; Davidson C. G. et Gobin S. M., 1998).
Phleum sp. includes fodder species; the most appreciated and cultivated in many countries is *Ph. pratense* L. This is an excellent fodder (9/9), of high productivity, up to 15 t phytomass/Ha, with useful phytomass 8/9; it is cultivated in Europe and North America, for grazing and hay, in ecological restoration works on pastures, hayfields, meadows, wet hills, mountain areas up to the alpine level (Zeven AC et de Wet J. M. J., 1975; Maruşcă T., 2008; 2019). It is very well adapted to soils, polluted with heavy metals, it has high phytostabilization (Nefed'eva E. E., et al., 2020), low capacity for radionuclides accumulation (Dushenkov S., 2003). It is decorative with its drooping inflorescences and purple anthers, it covers the ground well, and it is slightly invasive (Oakes A. J., 1990; Davidson C. G. et Gobin S.M., 1998).
The other species are adapted to more difficult soil conditions, they have good fodder value and with a smaller amount of useful phytomass.
Phleum alpinum L. has low productivity but good fodder value (6/9), with limited useful phytomass (3/9) (Maruşcă, 2019).
Phleum hirsutum Honck. is good fodder (6/9) with useful phytomass of 5/9. It is sporadically distributed at the sessile oak and beech levels and is considered under threat (Maruşcă, 2019).
Phleum montanum K. Koch is a good fodder species (6/9) with useful phytomass of 5/9 and occurs sporadically in hill and mountain areas (Maruşcă, 2019).
Phleum phleoides (L.) Karst. is widely distributed, has good fodder value (6/9), high productivity, and low useful phytomass (4/9). It is well adapted to dryness and nitrogen deficiency in plain and hilly areas (Maruşcă, 2019).
Phragmites australis (Cav.) Trin., Reed, has extremely high productivity, frequently 30-40 t/ha, on the plain it reaches up to 60 t green mass/ha. It has remarkable ecological and economic importance because in the Danube Delta there are the largest areas in the world. It is also present on smaller lakes on the surface of the country.

It has been rarely used in Romanian folk medicine. In 2020, Majeed M. and collaborators report that it is used in veterinary ethnomedicine in Pakistan.
In meadows it is harmful to the grassy carpet, it is a plant very rich in indigestible fibers, it is rarely consumed by animals in the very early spring, in the early growth phase.
It brings a large contribution of minerals to agriculture but it is a weed that does not die even after drying.
It is a poor quality raw material for the paper industry.
For people in disadvantaged areas it was in the past a good and unexpensive raw material for making animal roofs, haystacks, fences and roofs for houses. It is also used in artisanal constructions in the Danube Delta, it has a special ecological and tourist value. Small quantities of reed have been exported to other countries. Reed landscapes are attractive.
It is not important for beekeeping as a melliferous plant, very small quantities of honey are obtained (Dihoru Gh., 2023).
It is good as a source of biogas from wet plants (Roj-Rojewski S., et al., 2019).
It forms the thickest carpet of intertwined roots, it filters water and soil very well, it retains sediments and the most diverse substances that have reached the water. The process is not complete but is of remarkable importance. 5% of the Danube River waters pass through the reed beds in the Danube Delta and are filtered, the rest flows through channels into the Black Sea. It is the most effective plant for cleaning suspended waters. A large volume of plant mass and sediments helps significantly in decontaminating soil and waters contaminated with heavy metals.
It fixes sands very well in low places on the Letea and Caraorman hills, on small surfaces and in other places. Zeven A. C. and de Wet J. M. J. (1975) says that it restores lands and protects banks.
Piptatherum holciforme (M. Bieb) Roem. & Schult. and *P. virescens* (Trin.) Boiss have a sporadic spread in low-altitude deciduous forests. They are shade herbs, attractive in terms of the shape of the inflorescence, very resistant to dry soil, which need a neutral to slightly alkaline pH. They are decorative, poor fodder for deer but also for domestic animals, their seeds were occasionally consumed in the past in several countries.
In Romania *Piptatherum virescens* (Trin.) Boiss is appreciated as a poor fodder (Pop I., 1982).
In the genus *Poa*, there are are good fodder species. According to Keskin M. and his collaborators (2024), the buds of the inflorescences or their seeds contain nutrients, can be consumed but they have poor fodder value. Many are grown as decorative in green spaces for covering the ground with grass, if the soil is contaminated with heavy metals these plants penetrate into the hay of the animals. Poa cultivation works can also be appreciated as ecological restoration works.
Poa alpina L. is a good fodder (7/9), with very little useful phytomass 2/9, frequent in subalpine and alpine levelss, which colonizes mining areas well, absorbs Pb and Zn (Fernández S., et al., 2016).
Poa angustifolia L. is a plant adapted to very well-lit meadows, poor in water and nitrogen, from plains to mountains levels. It has a good fodder value (7/9), with useful phytomass 5/9, high degree of consumption by animals, good pastoral value, it produces 7.5 - 12.5 t/ha of green mass, it provides fodder on pastures (Maruşcă T., 2019). It can be cultivated as a lawn on difficult terrain, it prevents erosion, it is decorative (Oakes A. J., 1990). It is very good for restoring alfalfa because it strongly competes with weeds (Török P., et al., 2009).
Poa annua L. frequently grows on trampled places, with sufficient mineral nitrogen, from plains to alpine levels. It has low productivity, good fodder value (7/9), because animals consume the inflorescences and leaf tips, it is very short and with only 2/9 useful phytomass, resistant to grazing (Maruşcă T., 2019); It is a good fodder for gastrointestinal diseases of animals (Majeed M., et al., 2020). It is also important for ecological restoration, as bioindicator plants pollution with Ni (Salinitro M., et al. 2019) and HAP (Hong S. H., et al., 2009).
Poa bulbosa L. is frequent and covers the soil with difficulty in dry, sunny meadows that are very poor in nitrogen, with degraded vegetation, from plains to the beech level. It has little phytomass, is a good fodder (6/9), with extremely low useful phytomass, only 1/9 (Maruşcă T., 2019; Osmonali B., et al., 2024).
It is occasionally cultivated in North America as a decorative plant due to its glaucous color, and it is used in dried flower arrangements (Oakes A. J., 1990). Recent studies consider the value of the nutrients in the inflorescences, if it can be used for vegetation coverage of lands with slightly saline soil or contaminated with heavy metals (Khan A. et Qaiser M., 2006; Hesami R., et al., 2017; Keskin M., et al., 2024).
Poa chaixii Vill. is a good fodder (7/9), with a useful phytomass of 7/9 (Maruşcă T., 2019). As a decorative plant in open spaces with little shade, it provides good ground cover as a lawn substitute (Oakes A. J., 1990).
Poa compressa L. is common on stony, sunny and dry places, in plains and hills area, with good fodder value (6/9) and useful phytomass 3/9 (Maruşcă T., 2019); It is cultivated as a decorative plant, it has a glaucous green color, excellent ground cover, forms a dense lawn (Oakes A. J., 1990).
Poa laxa Haenke is relatively rarely spread in the alpine level of the Eastern and Southern Carpathians, it is endemic and vulnerable. It has a medium value of 5/9, but with little useful phytomass 2/9 (Maruşcă T., 2019).
Poa media Schur is sporadically spread in the subalpine and alpine levels of the Eastern and Southern Carpathians, it has a medium fodder value of 5/9, with little useful phytomass 2/9 (Maruşcă T., 2019).
Poa molinerii Balb. subsp. *molineri* is sporadic in the montane and subalpine level, vulnerable, with good fodder value 3/5 (Kovacs At., 1979).

Poa nemoralis L., Dense grass, has low productivity, good fodder value 7/9, with low useful phytomass (4/9), it is difficult to germinate, it is resistant to shading (Maruşcă T., 2019), can be grown as a decorative lawn in shaded green spaces (Oakes A. J., 1990).
Poa palustris L. is good fodder 6/5 (Kovacs At., 1979; Pop I., 1982), it is cultivated in some places in Europe (Zeven A. C., de Wet J. M. J., 1975).
Poa pratensis L. is introduced into the crop, it has a very good fodder value of 8/9, with a useful phytomass of 6/9, (Maruşcă T., 2019). It is frequently cultivated on bare and polluted lands (Gajic G., et al., 2019). For ecological restoration works, it is cultivated in mixtures of fodder plants on dry and eroded hills, on wet hills up to 1200 m altitude in mountainous areas, it resists drought, frost, grazing and trampling (Maruşcă T., 2008). It stabilizes slopes subject to landslides in soil bioengineering works. It is an indicator for the restoration of degraded ecosystems (Giupponi L., Leoni L., 2020). It is grown as a lawn on difficult terrain, prevents erosion (Oakes A. J., 1990; Preda M., 1989).
On soils polluted with heavy metals, it accumulates Cd, Pb, Zn (Liu H., et al., 2019; He et al., 2009; ap. Gupta D. K., et al., 2020; Korzeniowska J. et Stanislawska-Glubiak G., 2023).
Poa rehmannii (Asch. & Graebn.) K. Richt. is a good fodder (3/5) (Kovacs At., 1979).
Poa supina Schrad. is common in the alpine and subalpine levels of the Eastern and Southern Carpathians, it has effects in inflammations (Alamger et al., 2018).
Poa trivialis L. is a good fodder species, common in wet or marshy meadows with nutrient-rich soils, occurring from the oak forest zone up to the spruce level. Subsp. *silvicola* (Guss.) H. Lindb. has a higher fodder value (8/9) compared to subsp. *trivialis* (7/9); both subspecies have a useful phytomass of 6/9. They are also appreciated as ornamental grasses in green areas (Preda, 1989).
Polypogon monspeliensis (L.) Desf. it grows on moist and salty coastal sands, frequent on polluted soils in Sulina, it is rare and under threat in Romania, decorative with its silky, yellow-green or brown inflorescence (Oakes A. J., 1990). It is used by Turks and Indians, it has effects in cardiac disorders, palpitations, both in humans and animals.
Puccinellia sp. are short, saline fodder grasses with the lowest productivity, which establish a grassy carpet that does not cover the soil well. During a year of vegetation it cannot support even a single sheep with fodder.
Puccinellia distans (L.) Parl. subsp. *limosa* (Schur) Jáv. is common on saline chloride lands, it is a good fodder, 7/9, with a small amount of useful phytomass 3/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019). It partially covers and protects the soil, it has very low biomass, can also be considered a decorative plant (Oakes A. J., 1990; Török P., et al., 2019). The seeds are small and very poorly edible (1/5) (Plants for a Future, 2012–2022; Keskin M., et al., 2024). It accumulates heavy metals from polluted soils, it concentrates very large amounts of Bo and Se (Kök AB, et al., 2019 Visconti D., et al., 2020).
Puccinellia festuciformis (Host.) Parl. subsp. *intermedia* Schur; subsp. *convoluta* (Hornem.) W. E. Huges has the same qualities, it is a fodder with a medum value of 6/9 but with a useful phytomass of 4/9 (Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019).
Secale sylvestre Host grows sporadically on steppe and forest-steppe sands, it has edible seeds (3/5) (Plants for a Future, 2012–2022). It is good for restoring sandy habitats, stabilizes sands on gravels in the Danube Delta and other places.
Secale strictum C. Presl. is rarely distributed in beech and spruce levels, it is endangered in Romania, it has economic (Eduard E. T., 1986) and ecological importance for the phytoremediation of soils contaminated with Cd and Pb (Moameri M., Khalaki M. L., et al., 2017).
Sesleria rigida Heuff., Rabbit's tail, subsp. *rigida;* subsp.*haynaldiana* (Schur) Beldie, is sporadically distributed in mountainous areas, it has a poor fodder value of 4/9, with very low useful phytomass, 2/9 (Maruşcă T., 2019).
Setaria has adventitious species, which frequently cause problems in agriculture. Sometimes they are used as fodder, the spiked stem is rich in fiber but only the leaves are consumed. They produce large quantities of seeds that support rodents as food.
Setaria pumila (Poir) Roem & Schult has edible seeds (2/5) (Plants for a Future, 2012–2022), good fodder value, with beneficial effects for animals with digestive disorders, indicated in general weakness, etc. (Majeed M., et al., 2020).
Setaria verticillata (L.) P. Beauv., has spikelets with cilia on the awns, clings to fabrics and has mediocre fodder value (Pop I., 1982).
Setaria viridis (L.) P. Beauv. is a good fodder, with good effects in urinary disorders, fever and lack of vitality in animals (Majeed M., et al., 2020) The seeds have a poor food value (2/5); they can be consumed mixed with cereal flour and exhibit diuretic, emollient and tonic effects.The presence of this plant on mobile sand dunes contributes to the stabilization of sands, it is an indicator of degraded vegetation (Osmonali B., et al., 2024; Zuo X., et al., 2008). On the sands of the Danube Delta it is sporadically present.
Sorghum halepense (L.) Pers. is adventitious in the Flora of Romania, it has become an invasive weed, it is frequent in ruderal crops and places, in hilly and plain areas. It produces a large amount of biomass, can reach 15-20 t/ha, it has a very good fodder value only in the form of hay. Harvested in a green state it is toxic (Pop I., 1982; Zeven A. C. et de Wet J. M. J., 1975; Plants for a Future, 2012–2022). It is not sufficiently studied as a medicinal plant;

the young inflorescences are empirically used in baths for articular rheumatism (Pârvu, C., 2013). Edible seeds have a medium value of 3/5.
For bees, it provides up to 10 kg of honey/ha (Dihoru Gh., 2023).
It is decorative; its invasive nature recommends it for soil protection against erosion and for phytoremediation, it accumulates Pb, Cd, Co, Cu, Cr, Ni, Zn, Cu (Pandey V. C., Maiti D., 2020). It also grows on ash dumps from thermal power plants (Gajic G., et al., 2019). In Arab countries, it has been observed that it is poorly tolerant of oil-polluted soils (Alavi N. et al., 2016).
In the genus *Sporobolus* (*Crypsis)* there are 3 short species, with low fodder value: *S. aculeatus* (L.) P. M. Peterson (*C. aculeata* (L.) Aiton), *S. alopecuroides* (Piller & Mitterp.) P. M. Peterson (C. *alopecuroides* (Piller & Mitterp.) Schrad. And *S. schonoides (L.)* P. M. Peterson (*C. schonoides* (L.) Lam., widespread in saline and very nitrogen-poor meadows in the plain. Among these, *S. aculeatus* (L.) P. M. Peterson (*C. aculeata* (L.) Aiton has been used empirically and rarely in gastric and abdominal pain (Marian S. Fl., 1870-1907; Dihoru Gh., Boruz V., 2014; Keskin M., et al., 2024).
Habitats with *Stipa* sp. were reduced in the second half of the 20th century. These plants are very resistant to moisture and nitrogen deficiency, they form unique landscapes with their silver-green color, they are used in dried flower bouquets, they protect the soil against erosion, and maintain biodiversity. They have a structure specific to strongly xerophilic plants, the stem and leaves are very rich in fiber, they are not consumed by animals at all. They are present in ancient folk songs and they were used to make whitewash brushes.
Sipa borysthenica Prokudin subsp. *borystenica* is rare, it covers and protects the sands of the Danube Delta.
Stipa capillata L. is common in arid meadows, often with stony substrate, in plains and hills areas. It protects erodible soils on slopes very well. It is decorative (Preda M., 1989; Davidson C. G., Gobin S. M., 1998), ie accumulates Sn (Pandey V. C., Maiti D., 2020).
Stipa pennata L. and S. *pulcherrima* K. Koch. are sporadically spread in the same environmental conditions, they have the same uses. In competition with other plants they have a slightly overwhelming character and are maintained in the vegetal carpet.
Tragus racemosus (L.) All. is a short plant, sporadically spread in arid areas of the steppe and oak forests; on sandy, ruderal or cultivated soils, it was not used by Romanians; we found mentions in Indian veterinary ethnomedicine where the decoction is used for digestive disorders at animals (Majeed M., et al., 2020); it was also used in Turkey (Keskin M., et al., 2024).
Trisetum flavescens (L.) P. Beauv., Golden Oat, is common in hill and meadow, on moist and fertile soils, it is introduced into culture in some countries in Europe, including Romania. It has high productivity, very good fodder value (8/9), with useful phytomass 6/9, it sprouts very well after mowing, and it is sensitive to frost (Zeven A. C. et de Wet J. M. J., 1975; Kovacs At., 1979; Pop I., 1982; Maruşcă T., 2019).
Ventenata dubia (Leers.) Coss., is sporadically spread in dry and sunny places, in plain and hilly areas and it has poor fodder value (Pop I., 1982).
Vulpia myuros (L.) C. C. Gmel. is common, it is extremely resistant on dry soil and with very little nitrogen, it protects soils on sloping sites, it can penetrate as a weed into nearby crops (Achter M. J., et al., 2020). It is a pioneer on soil contaminated with heavy metals and various amendments. Through phytostabilization it raises the pH values (Yang et al., 2016), it is a species of mobile and semi-fixed dunes (Lemauviel S., Rose F., 2003).
V. bromoides (L.) Gay., is rare in the Flora of Romania.

Table 1 - Species with economic and ecological importance from the Poaceae Family

No.	Species	Categories of use	Observations
1	*Aegilops cylindrica* Host.	medium fodder (4/9), edible (1/5), ecological importance	sporadic
2	*Aegilops lorentii* Hochst.	poor fodder (2/9), ecological importance	rare in Banat and Mehedinți
3	*Aegilops triuncialis* L.	poor edible (1/5), ecological importance	it is rarely distributed in Romania, under threat
4	*Aeluropus littoralis* (Willd.) Parl.	poor fodder (2/9), phytoremediation, ecological restoration	-
5	*Agropyron cristatum* (L.) Gaertn. subsp. *pectinatum* (M. Bieb.) Tzvelev.	good fodder (7/9), very good ecological restoration, good phytoremediation	-
6	*Aira elegans* Schur	decorative	-
7	*Aira caryophyllea* L.	decorative	rare
8	*Agrostis alpina* L.	medium fodder (5/9), decorative	rare and under threat
9	*Agrostis canina* L. subsp. *canina*	medium fodder (6/9),	-

No.	Species	Categories of use	Observations
		ecological restoration	
10	*Agrostis capillaris* L.	good fodder (7/9), decorative, good ecological restoration, good phytoremediation	-
11	*Agrostis gigantea* Roth.	good fodder (7/9), veterinary ethnomedicine	-
12	*Agrostis castellana* Boiss. & Reut. (Syn. *A. moldavica* Dobrescu & Beldie)	good fodder (7/9)	rare
13	*Agrostis rupestris* All.	poor fodder (2/9), decorative	
14	*Agrostis stolonifera* L.	good fodder (7/9), decorative, ecological restoration, phytoremediation	-
15	*Agrostis vinealis Schreb.*	ecological importance	-
16	*Alopecurus aequalis* Sobol	poor fodder (2/9), decorative, medicinal	-
17	*Alopecurus arundinaceus* Poir.	medium fodder (4/9)	-
18	*Alopecurus geniculatus* L.	average fodder (5/9)	-
19	*Alopecurus pratensis* subsp. *laguriformis* (Schur) Tzvelev	very good fodder (8/9)	endemic Carpathian, vulnerable
20	*Alopecurus myosuroides* Huds	mediu fodder (4/9)	-
21	*Alopecurus pratensis* L.	very good fodder (8/9), ecological restoration, poor phytoremediation, decorative	-
22	*Ammophila arenaria* (L.) Link. subsp. *arundinacea* H. Lindb. Fil	ecological restoration, decorative	-
23	*Anthoxanthum odoratum* L.	average fodder (5/9), toxic, cosmetic, phytotherapy, ecological restoration, decorative	-
24	*Apera spica-venti* (L.) P. Beauv.	medium fodder (5/9), ecological restoration	-
25	*Arrhenatherum* elatius (L.) J. Presl	good fodder (8/9), decorative, ecological restoration, good phytoremediation	-
26	*Avena barbata* Pott	straw source, edible seeds (2/5)	rare
27	*Avena fatua* L.	straw source, edible seeds (2/5)	-
28	*Avena sterilis* L. subsp. *ludoviciana* (Durien) Gillet & Magne	straw source, edible seeds 3/5, veterinary ethnomedicine, decorative	-
29	*Avenula pubescens* (Hudson) Dumort	protects soil as decorative	-
30	*Beckmannia eruciformis* (L.) Host.	good fodder (7/9), edible seeds (2/5), household uses, decorative	-
31	*Brachypodium pinnatum* (L.) P. Beauv.	average fodder (4/9), decorative, ecological restoration	-
32	*Brachypodium sylvaticum* (Huds.) P. Beauv.	average fodder (4/9), decorative	-
33	*Briza media* L.	poor fodder (2/9), decorative	-
34	*Bromus commutatus* Schrad.	poor fodder (2/9),	-
35	*Bromus erectus* Huds. (incl. *B. arvensis* L.)	medium fodder (6/9), protects the soil	-
36	*Bromus hordeaceus* L.	protects the soil	-

No.	Species	Categories of use	Observations
37	*Bromus inermis* Leyss	very good fodder (8/9), decorative, ecological restoration, good phytoremediation	-
38	*Bromus japonicus* Thunb.	poor fodder (3/9), veterinary ethnomedicine	-
39	*Bromus ramosus* Huds.	poor fodder (3/9)	-
40	*Bromus secalinus* L.	abandoned fodder, decorative	
41	*Bromus squarrosus* L.	medium fodder (5/9), poor phytoremediation	-
42	*Bromus sterilis L.*	protects the soil	-
43	*Bromus tectorum* L.	protects the soil	-
44	*Calamagrostis arundinacea* (L.) Roth.	biomass source, ecological restoration, good phytoremediation, decorative	-
45	*Calamagrostis canescens* (Weber) Roth.	decorative	-
46	*Calamagrostis epigejos* (L.) Roth.	poor fodder (2/9), decorative, ecological restoration, phytoremediation	-
47	*Calamagrostis pseudophragmites* (Haller fil.) Koeler	ecological restoration,	-
48	*Calamagrostis villosa* (Chaix.) J. F. Gmel.	decorative, biomass source, protects the soil	-
49	*Catabrosa aquatica* (L.) P. Beauv.	medium fodder (4/9), ecological restoration,	-
50	*Chloris barbata* (L.) Sw.	veterinary ethnomedicine	adventitious, found in the port of Constanța
51	*Chrysopogon gryllus* (L.) Trin.	medium fodder (4/9), ecological restoration, decorative	
52	*Corynephorus canescens* (L.) P. Beauv.	protects the soil	rare
53	*Crypsis aculeata* (L.) Aiton	poor fodder (2/9) ecological restoration, poor medicinal value	-
54	*Crypsis alopecuroides* (Piller & Mitterp.) Schrad.	ecological restoration, medium fodder (4/9)	-
55	*Crypsis schonoides* (L.) Lam.	ecological restoration, medium fodder (4/9)	-
56	*Cynodon dactylon* (L.) Pers.	good fodder (6/9), phytotherapy, veterinary ethnomedicine, ecological restoration, phytoremediation	-
57	*Cynosurus cristatus* L.	good fodder (7/9), decorative	-
58	*Cynosurus echinatus* L.	medium fodder (4/9)	-
59	*Dactylis glomerata* L.	excellent fodder (9/9), veterinary ethnomedicine, decorative, ecological restoration	-
60	*Dactylis glomerata* subsp. *lobata* (Drejer) H.Lindb *(D. polygama* Horv.)	good fodder (7/9)	-
61	*Danthonia alpina* Vest.	medium-good fodder (5/9), Protects the soil	-
62	*Danthonia decumbens* (L.) DC.	average fodder (4/9), protects the soil	-
63	*Deschampsia caespitosa* (L.) P. Beauv.	phytoremediation, decorative	-
64	*Deschampsia flexuosa* (L.) Trin.	average fodder (4/9), decorative	-

No.	Species	Categories of use	Observations
65	*Digitaria ciliaris* (Retz.) Koeler	ecological restoration, phytoremediation	rare
66	*Digitaria ischaemum* (Schreb.) Muhl.	phytoremediation	-
67	*Digitaria sanguinalis* (L.) Scop.	edible (2/5), ecological restoration, phytoremediation, medicinal	-
68	*Echinochloa crus-galli* (L.) P.Beauv.	medium fodder (5/9), veterinary ethnomedicine, phytoremediation	-
69	*Elymus caninus* (L.) L.	decorative	-
70	*Elymus elongatus* (Host) Runemark	phytoremediation, decorative	-
71	*Elymus farctus* (Viv.) Melderis subsp. *farctus*	ecological restoration, decorative	subsp. *bessarabicus* (Săvul. Rayss.) Melderis is rare
72	*Elymus hispidus* (Opiz.) Melderis	medicinal, decorative, average fodder (5/9), protects soil, phytoremediation	-
73	*Elymus repens* (L.) Gould	good fodder (6/9), medicinal (3/5), edible (2/5), veterinary medicine, cosmetics, protects the soil	-
74	*Eragrostis cilianensis* (All.) Vignolo ex Janch.	etnoveterinary medicine	-
75	*Eragrostis minor* Host.	ecological restoration, decorative, veterinary ethnomedicine	-
76	*Eragrostis pilosa* (L.) P. Beauv.	edible, medicinal, ecological restoration, decorative	-
77	*Festuca airoides* Lam. (Syn. *F. supina* Schur)	poor fodder (2/9), decorative	
78	*Festuca altissima* All.	average fodder (5/9)	-
79	*Festuca amethystina* L.	average fodder (5/9), decorative	under threat
80	*Festuca arundinacea* Schreb.	very good fodder (8/9), ecological restoration, protects the soil, decorative	-
81	*Festuca bekeri* (Hack.) Trautv.	protects the soil	rare
82	*Festuca callieri* (Hack. ex St.-Yves)	average fodder (5/9), decorative	rare, under threat
83	*Festuca carpatica* F. Dietr.	very good fodder value (7/9)	sporadic, Carpathian endemic, threatened
84	*Festuca drymeja* (Mert & W. D. J. Koch) Holub.	decorative, good fodder (6/9)	-
85	*Festuca filiformis* Pourr.	decorative	-
86	*Festuca heterophylla* Lam.	good – very good fodder (7/9)	-
87	*Festuca gigantea* (L.) Vill.	fodder, decorative	-
88	*Festuca nigrescens* Lam.	good fodder (6/9)	-
89	*Festuca nitida* Kit. subsp. *flaccida* (Schur) Markgr.	poor fodder (2/9)	-
90	*Festuca ovina* L.	poor fodder (2/9), ecological restoration, decorative	-
91	*Festuca pallens* Host. subsp. *pallens*	poor fodder (2/9), decorative	-
92	*Festuca panciciana* (Hack.) K. Richt	decorative	-

No.	Species	Categories of use	Observations
93	*Festuca picturata* Pils (*F. picta* Kit.)	poor fodder (2/9)	-
94	*Festuca pratensis* Huds.	excellent fodder (9/9), decorative, ecological restoration, poor phytoremediation	-
95	*Festuca rubra* L.	good – very good fodder (7/9), decorative, ecological reconstruction, phytoremediation	-
96	*Festuca stricta* Host. subsp. *sulcata* (Hack.) Patzke ex Joch Müll	average fodder (4/9), ecological restoration	-
97	*Festuca vaginata* Walst & Kit. ex Willd.	good fodder (5/9), protects the soil	-
98	*Festuca valesiaca* Schleich. ex Gaudin	medium – good fodder (5/9), protects the soil	-
99	*Festuca versicolor* Tausch. subsp. *versicolor*	medium – good fodder (5/9)	subsp. *dominii* Krajin is rare and endemic
100	*Glyceria arundinacea* Kunth.	decorative, protects the soil	
101	*Glyceria fluitans* (L.) R. Br.	toxic, edible seeds (2/5), poor phytoremediation, decorative	-
102	*Glyceria notata* (Chevall.) Chevall.	toxic, poor edible seeds (1/5)	-
103	*Glyceria maxima* (Hartm.) Holmb.	toxic, poor to medium fodder (4/9), good phytoremediation, medium energy value, decorative, protects the soil	-
104	*Glyceria nemoralis* (R. Uechtr.) R. Uechtr. & Körn.	toxic	-
105	*Helictochloa compressa* (Heuff.) Romero Zarco	poor fodder (2/9)	
106	*Helictochloa planiculmis* (Schrad.) Romero Zarco	decorative	-
107	*Helictochloa praeusta* (Rchb.) Romero Zarco	decorative	-
108	*Helictochloa pratensis* (L.) Romero Zarco	medium value fodder (6/9), decorative	-
109	*Helictochloa versicolor* (Vill.) Romero Zarco	average fodder (5/9)	-
110	*Hierochloë australis* (Schrad.) Roem. & Schult.	decorative	-
111	*Hierochloë repens* (Host.) Simonk.	food industry, medicinal, decorative, insecticide, household uses, ecological restoration	-
112	*Holcus lanatus* L.	good fodder (6/9), decorative, phytoremediation	-
113	*Holcus mollis* L.	medium fodder (4/9), decorative	-
114	*Hordelymus europaeus* (L.) Harz.	medium fodder (5/9)	-
115	*Hordeum bulbosum* L.	medium fodder (5/9)	rare and under threat
116	*Hordeum geniculatum* All.	protects the saline soils	indicators of pastures degraded
117	*Hordeum jubatum* L.	poor fodder (2/9), decorative, ecological restoration on saline soils	rare
118	*Hordeum marinum* Huds	ecological restoration on saline soils, weak phytoremediation	-

No.	Species	Categories of use	Observations
119	*Hordeum murinum* Huds	medium fodder (5/9), medicinal, indicator of bioremediation	-
120	*Leersia oryzoides* (L.) Sw.	phytoremediation, ecological restoration, decorative	-
121	*Leymus racemosus* (Lam.) Tzvelev subsp. *sabulosus* (M. Bieb.) Tzvelev	decorative, ecological restoration, textile uses	rare, subendemic, under threat
122	*Lolium perenne* L.	very good fodder (8/9), decorative, good for ecological restoration, phytoremediation, empirical phytotherapy	-
123	*Lolium temulentum* L.	phytoremediation	-
124	*Melica altissima L.*	decorative	-
125	*Melica ciliata* L.	poor fodder (4/9), decorative	-
126	*Melica nutans* L.	phytoremediation	-
127	*Melica uniflora* Retz.	fodder for hunting game, decorative, food industry, cosmetics, pharmacy	-
128	*Melica transsilvanica* Schur	phytoremediation	-
129	*Milium effusum* L.	poor-average fodder (3/9), decorative, ecological restoration	-
130	*Molinia caerulea* (L.) Moench.	ecological restoration, decorative	-
131	*Nardus stricta* L.	protects the soil very well	-
132	*Oreochloa disticha* (Wulfen) Link.	average fodder (4/9), decorative, poor phytoremediation	sporadic in alpine meadows, under threat
133	*Parapholis incurva* (L.) C. E. Hubb.	ecological restoration	rare, occurring on salinized sands
134	*Phalaroides arundinacea* (L.) Rauschert	ecological restoration, bioindicators, biofuel, decorative	-
135	*Phleum alpinum* L.	good fodder (6/9)	-
136	*Phleum hirsutum* Honck.	good fodder (6/9)	under threat
137	*Phleum montanum* K. Koch	good fodder (6/9)	-
138	*Phleum phleoides* (L.) Karst.	good fodder (6/9)	-
139	*Phleum pratense* L.	excellent fodder (9/9), ecological restoration, good phytoremediation, decorative	-
140	*Phragmites australis* (Cav.) Trin.	domestic uses, biomass source, ecological restoration, very good phytoremediation, decorative	-
141	*Piptatherum holciforme* (M. Bieb.) Roem. Et Schult.	poor fodder (3/9), decorative	-
142	*Piptatherum virescens* (Trin.) Boiss	poor fodder (3/9), decorative	-
143	*Poa alpina* L.	good – very good fodder (7/9),	-
144	*Poa angustifolia* L.	good – very good fodder (7/9), decorative, ecological restoration	-
145	*Poa annua* L.	good – very good fodder (7/9), veterinary ethnomedicine, ecological restoration, bioindicators	-
146	*Poa bulbosa* L.	good – very good fodder (7/9), decorative	-

No.	Species	Categories of use	Observations
147	*Poa chaixii* Vill.	good – very good fodder (7/9), decorative	-
148	*Poa compressa* L.	good – very good fodder (7/9), decorative	-
149	*Poa laxa* Haenke	medium fodder (5/9)	endemic
150	*Poa media* Schur	medium fodder (5/9)	-
151	*Poa molinerii* Balb.	good fodder (6/9)	-
152	*Poa nemoralis* L.	good fodder (7/9), decorative	-
153	*Poa palustris* L.	good fodder (6/9)	-
154	*Poa pratensis* L.	very good fodder (8/9), decorative, ecological restoration	-
155	*Poa rehmannii* (Asch. & Graebn.) K. Richt.	good fodder (6/9)	-
156	*Poa supina* Schrad.	good fodder (6/9), medicinal	-
157	*Poa trivialis* L.	good fodder (7/9), decorative	-
158	*Polypogon monspeliensis* (L.) Desf.	decorative, medicinal	-
159	*Puccinellia distans* (L.) Parl. subsp. *limosa* (Schur) Jáv	good fodder (6/9), protects the soil, bioindicators	-
160	*Puccinellia festuciformis* (Host.) Parl. subsp. *intermedia* Schur, subsp. *convoluta* (Hornem.) W. E. Huges	medium fodder (6/9), protects the soil	-
161	*Secale strictum* C. Presl.	fodder, phytoremediation	rare and endangered
162	*Secale sylvestre* Host	ecological restoration, moderately edible (3/9)	-
163	*Sesleria rigida* Heuff.	poor – average fodder (3/9)	-
164	*Setaria pumila* (Poir) Roem & Schult	poorly edible (2/5) good fodder (6/9), veterinary ethnomedicine	-
165	*Setaria verticillata* (L.) P. Beauv.	mediocre fodder (5/9), veterinary ethnomedicine,	-
166	*Setaria viridis* (L.) P. Beauv.	medium fodder (6/9), veterinary ethnomedicine	-
167	*Sorghum halepense* (L.) Pers.	good fodder (7/9), decorative, a good source of pollen., phytoremediation, protects the soil	-
168	*Sipa borysthenica* Klokov ex Prokudin	ground cover	rare
169	*Stipa capillata* L.	decorative, ecological restoration	-
170	*Stipa pennata* L.	decorative, ecological restoration	-
171	*Stipa pulcherrima* K. Koch.	decorative, ground cover	-
172	*Tragus racemosus* (L.) All.	ground cover, veterinary ethnomedicine	-
173	*Trisetum flavescens* (L.) P. Beauv.	very good fodder (8/9),	-
174	*Ventenata dubia* (Leers.) Coss.	poor fodder (2/9), protects the soil, decorative	-
175	*Vulpia myuros* (L.) C. C. Gmel.	protects the soil, decorative poor fodder (2/9)	-

Categories of plants in the Poaceae family with economic and ecological value

Plants in the Poaceae family have long been known for their fodder value and for forming root mats in the surface layers of soil. We found information for 175 species that group the following categories of uses in economics and economic ecology: 116 forage species, 11 species with low or medium edible seeds, 11 species with modest therapeutic value, 1 species of interest to pharmacy, 14 species for veterinary ethnomedicine, 84 ornamental species, 5 species with energy value for industry, 1 honey plant species, 5 for household uses, 3 species in folk dermatology and cosmetics, 29 species of ecological and soil protection importance, 53 species in ecological restoration, and 37 species for phythoremediation (Table 1; Figure 1).

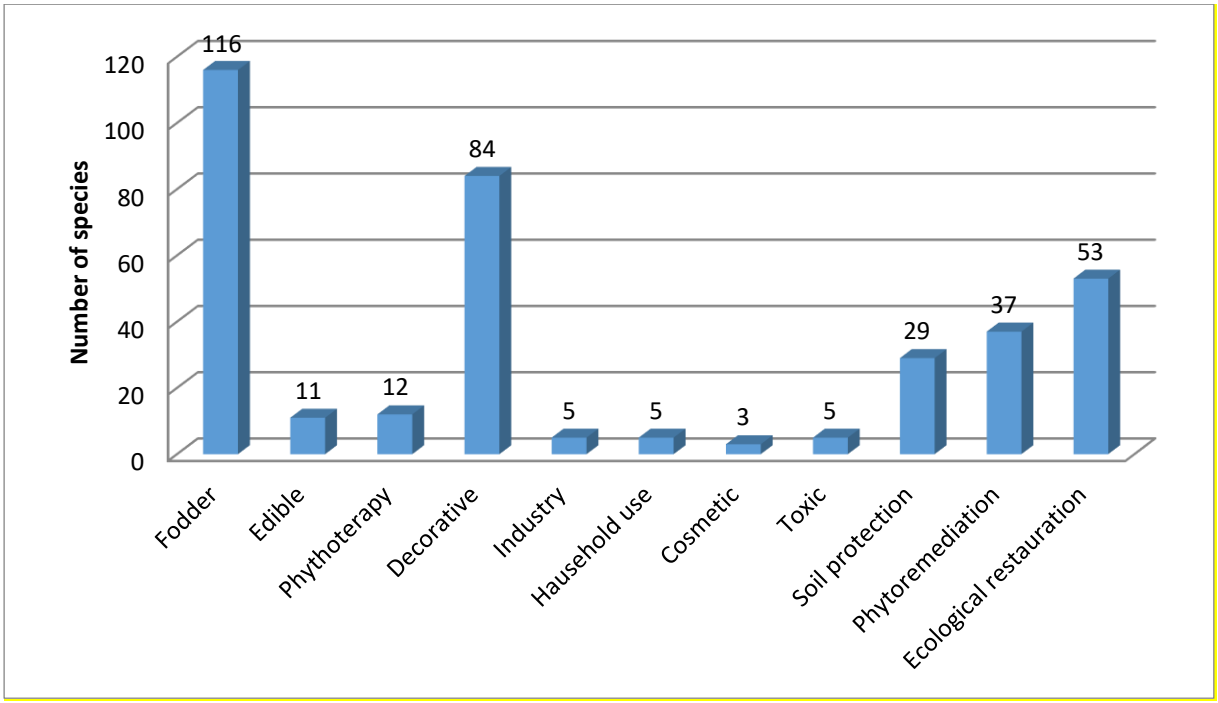

Figure 1. Categories of species uses from the Poaceae family

Forage plants are grouped into the following categories: 21 poor forage species, 7 medium-poor forage species, 18 medium forage species, 19 medium-good forage species, 14 good forage species, 16 good-very good forage species, 3 excellent forage species (Figure 2)

Fodder species, that have very good quality, are introduced into culture; the most appreciated are the following: *Alopecurus pratensis* L., *Bromus inermis* Leyss, *Arrhenatherum elatius* (L.) J. Presl. et C. Presl., *Dactylis glomerata* L., *Festuca arundinacea* Schreb., *F. pratensis* Huds., *Phleum pratense* L., etc.

Good quality fodder species are spread in all vegetative zones, in different areas, they are diverse; this category includes: *Agropyron cristatum* (L.) Gaertn subsp. *pectinatum* (M. Bieb.) Tzvelev, *Agrostis capillaris* L., *A. gigantea* Roth., *A. stolonifera* L., , *Beckmannia eruciformis* (L.) Host., *Cynosurus cristatus* L., *Dactylis polygama* Horv., *Festuca carpatica* F. Dietr., *F. heterophylla* Lam., *F. nigrescens* Lam., *F. rubra* L., *Lolium multiflorum* Lam., *L. perenne* L., *Phalaroides arundinacea* (L.) Rauschert, *Phleum alpinum* L., *Ph. hirsutum* Honck., *Ph. montanum* K. Koch, *Ph. phleoides* (L.) Karst., *Poa alpina* L., *P. angustifoia* L., *P. annua* L., *P. bulbosa* L., *P. chaixii* Vill., *P. compressa* L., *P. nemoralis* L., *P. pratensis* L., *P. rehmanii* (Asch. et Graebn.) Wolsz., *P. trivialis* L., *Setaria pumila* (Poir) Roem et Schult., *S. viridis* (L.) P. Beauv., *Sorghum halepense* (L.) Pers., *Trisetum flavescens* (L.) P. Beauv.

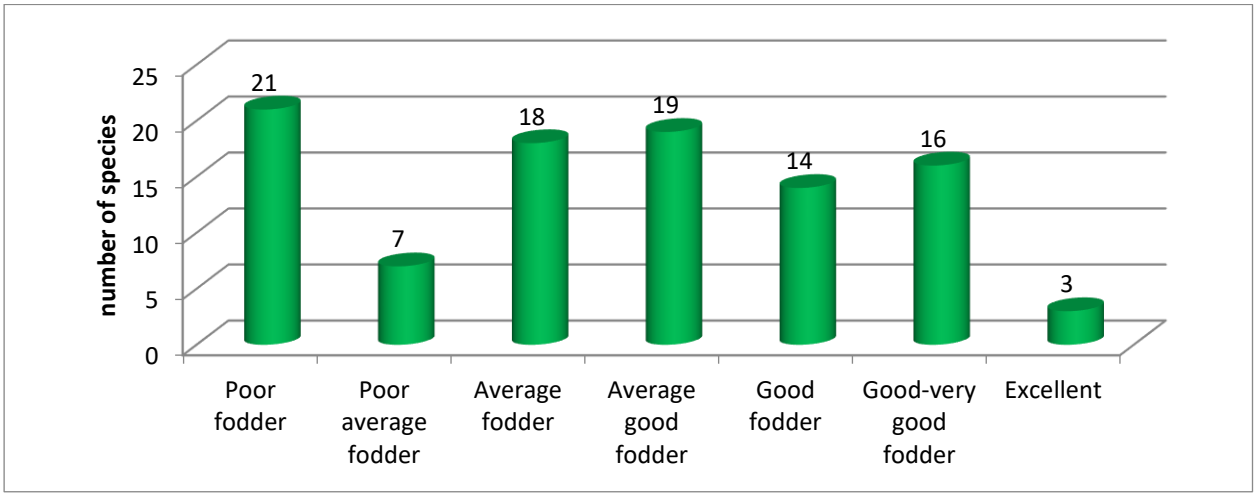

Figure 2. Categories of forage species in the Poaceae family

Species with medium fodder value have a weak contribution; they are: *Agrostis canina* L., *A. rupestris* All., *Apera spica-venti* (L.), *Avenula pratense* (L.) Dumort., *A. versicolor* (Vill.) M. Lainz., *Brachypodium pinnatum* (L.) P.B., *B. sylvaticum* (Huds.) P. Beauv., *Briza media* L., *Bromus erectus* Huds., *Danthonia alpina* Vest., *Echinochloa crus-galii* (L.) Beauv., *Elymus hispidus* (Opiz.) Melderis, *E. repens* (L.) Gould., *Festuca versicolor* Tausch., *Holcus lanatus* L., *Poa laxa* Haenke; *Puccinellia festuciformis* (Host.) Parl. subsp. *intermedia* Schur, subsp. *convoluta* (Hornem.) W. E. Huges, etc.

Mediocre fodder species have an minimally contribution to the fodder balance; this category includes: *Alopecurus arundinaceus* Poir., *Bromus arvensis* L., *B. squarosus* L., *Catabrosa aquatica* (L.) P. Beauv., *Crypsis alopecuroides* (Piller et Mitterp.), *C. schonoides* (L.) Lam., *Festuca ovina* L., *Poa media* Schur, *Setaria verticillata* (L.) P. Beauv.

Weak fodder plants are dominated by *Festuca*; the meadows dominated by these plants are exploited during spring as pastures or in summer for hay. The list of these plants includes the following species: *Aeluropus littoralis* (Willd.) Parl., *Alopecurus aequalis* Sobol., *A. geniculatus* L., *Anthoxanthum odoratum* L., *Avenula compressa* (Heuff.) W. Sauer et Chmel., *Bromus japonicus* Thund., *B. ramosus* Huds., *Crypsis aculeata* (L.) Aiton, *Cynodon dactylon* (L.) Pers., *Danthonia decumbens* (L.) DC., *Deschampsia flexuosa* (L.) Trin., *Elymus hispidus* (Opiz.) Melderis, *Festuca amethystina* L., *F. callieri* (Hack. Ex St.-Yves) Markgr., *F. nitida* Kit. subsp. *flaccida* (Schur) Markgr., *F. ovina* L., *F. pallens, F. picturata* Pils, *F. stricta* Host. subsp. *sulcata* (Hack.) Patzke ex Joch Müll *F. supina* Schur, *F. vaginata* Walst et Kit. ex Willd., *F. valesiaca* Schleich. ex. Gaudin subsp. *parviflora* (Hack.) Tracey, *F. versicolor* Tausch., *Melica ciliata* L., *Milium effusum* L., *Oreochloa disticha* (Wulfen) Link., *Sesleria rigida* Heuff., *Ventenata dubia* (Leers.) Coss.

We introduce a category of plants about which we have little information. We know that animals instinctively choose the best fodder, in meadows they have the possibility of finding several species and consuming the best one. We believe that investigations are necessary on plants with very little or unknown fodder potential. These could be consumed by animals occasionally, young, in the early growth phase or only the inflorescences, by goats or horses in conditions of severe drought or in winter. We complete the fodder inventory with the following: *Bromus japonicus* Thunb., *B. rigidus* Roth., *B. secalinus* L., *Hordelymus europaeus* (L.) Harz., *Piptatherum holciforme* (M. Bieb) Roem. et Schult., *P. virescens* (Trin.) Boiss, *Poa supina* Schrad., etc.

Inflorescences and seeds can be consumed occasionally by animals; this category includes: *A. fatua* L., *A. sterilis* L. subsp. *ludoviciana* (Durien) Gillet et Magne, *Aira caryophyllea* L., *Bromus commutatus* Schrad, *B. hordeaceus* L., *Dasypyrum villosum* (L.) P. Beauv., *Digitaria sanguinalis* (L.) Scop, *Eragrostis minor* Host., *E. pilosa* (L.) P. Beauv., *Festuca drymeja* (Mert & W. D. J. Koch) Holub., *F. gigantea* (L.) Vill. *Glyceria fluitans* (L.) R. Br., *Hordeum geniculatum* All., *Secale sylvestre* Host, *Tragus racemosus* (L.) All.

When arranging green spaces, grasses are very good for covering the ground with vegetation, they are easy to grow and they are persistent. The biomass obtained by mowing or trimming can be used as animal feed only if it is harvested from places free from pollution, never from cities. In this regard we mention the following plants: *Agrostis alpina* L., *A. capillaris* L., *A. rupestris* All., *A. stolonifera* L., *Alopecurus aequalis* Sobol., *A. pratensis* L., *Arrhenatherum* elatius (L.) J. Presl et C. Presl., *Beckmannia eruciformis* (L.) Host., *Brachypodium pinnatum* (L.) P. Beauv., *B. sylvaticum* (Huds.) P. Beauv., *Briza media* L., *Cynosurus cristatus* L., *Dactylis glomerata* L., *Deschampsia flexuosa* (L.) Trin., *Festuca arundinacea* Schreb., *F. ovina* L… *F. pallens, F. rubra* L., *Holcus lanatus* L., *Lolium multiflorum* Lam., *L. perenne* L., *Oreochloa disticha* (Wulfen) Link., *Phleum pratense* L., *Poa pratensis* L., *P. trivialis* L., *Sorghum halepense* (L.) Pers., *Trisetum flavescens* (L.) P. Beauv.

On saline soils, herbaceous ornamentals with rhizomes are grown; the following are recommended: *Bromus, Calamagrostis, Puccinellia, Scirpus, Typha, Agrostis stolonifera, Cynodon dactylon, Glyceria maxima.* (Oakes A. J., 1990).
Helictotrichon pubescens and *Descchampsia caespitosa* are grown on difficult soils (Oakes A. J., 1990).
In dried bouquets, there are frequently used *Stipa capillata* plants, occasionally can be also used other plants, such as: *Leersia oryzoides* (L.) Sw., *Melica ciliata* L., *Polypogon monspeliensis* (L.) Desf., etc.
For the ecological restoration of the grassy carpet, the maintenance of biodiversity, the protection against erosion, the stabilization of some lands, etc. there are grasses for all types of ecosystems, from sands and salts, from low altitude to meadows in high mountain areas. Many of these achieve a natural projection, they are rarely cultivated, some of them are fodder, others are also decorative. There are species without fodder value but which have an important role in ecosystems.
For the ecological restoration of degraded meadows, fodder plants are sown, which later attract better biodiversity. *Agrostis capillaris* L. and F. *rubra* adapt to variable ecological conditions. *F. valesiaca* and *F. sulcata* are not cultivated but they protect the substrate on which they are established well. *Arrhenatherum elatius* (L.) J. Presl is the most valuable fodder, cultivated on meadows, it is very productive, on slopes it tolerates slightly dry soils, it is indifferent to temperature variations. Good fodder plants are *Alopecurus pratensis* L.*, Phleum pratense* L., *Poa pratensis* L., etc.
On medium or slightly arid soils, good protectors of the soil and biodiversity are: *Anthoxanthum odoratum* L., *Bromus inermis* Leyess, *Brachypodium pinnatum* (L.) P. Beauv., *Calamagrostis arundinacea* (L.) Roth., *Festuca ovina* L., etc. Arid lands with *Stipa capillata* L., *S. pennata* L and other xerophilic plants are not recommended for pastoral exploitation.
Lands with sufficient moisture and alluvial lands can be exploited by sowing with *Agrostis stolonifera* L., *Calamagrostis pseudophragmites* (Haller fil.) Koeler, *Catabrosa aquatica* (L.) P. Beauv., *Festuca arundinacea* Schreb., *F. pratensis* Huds., *Lolium perenne* L. Large quantities of fodder will be obtained, soils are protected and species diversity is increased.
Sand plants need a very deep root system. In the Poaceae family there are several species adapted to very arid, stony, loamy-sandy climates such as *Cynodon dactylon* (L.) Pers., *Eragrostis minor* Host., *E. pilosa* (L.) P. Beauv.*, Digitaria ciliaris* (Retz.) Koeler, *Secale sylvestre* Host.
On saline soils with chlorides, the following can be colonized: *Aeluropus littoralis* (Willd.) Parl., *Cynodon dactylon* (L.) Pers., *Hordeum jubatum* L., *H. marinum* Huds., *Puccinellia distans* (L.) Parl.
All grasses cover the soil but on very difficult soils they have a decisive role in protecting and restoring ecosystems. In this category we have included: *Bromus sterilis* L., *Bromus tectorum* L. *Corynephorus canescens* (L.) P. Beauv., *Danthonia alpina* Vest., *D. decumbens* (L.) DC. *Festuca bekeri* (Hack.) Trautv., *Hordeum geniculatum* All., *Hordeum jubatum* L., *H. marinum* Huds *Nardus stricta* L. *Stipa pulcherrima* K. Koch., *Tragus racemosus* (L.) All., etc.
Good phytoremediation is achieved with *Agrostis capillaris* L., *Arrhenatherum elatius* (L.) J. Presl., *Calamagrostis arundinacea* (L.) Roth., *Phleum pratense* L., *Phragmites australis* (Cav.) Trin.
Weak, sometimes notable phytoremediation processes also achieve: *Aeluropus littoralis* (Willd.) Parl., *Agropyron cristatum* (L.) Gaertn subsp. *pectinatum* (M. Bieb.) Tzvelev., *Agrostis stolonifera* L. *Calamagrostis epigeios* (L.) Roth., *Cynodon dactylon* (L.) Pers., *Digitaria ciliaris* (Retz.) Koeler, *D. ischaemum* (Schreb.) Mühl., *D. sanguinalis* (L.) Scop, *Echinochloa crus-galii* (L.) Beauv., *Elymus elongatus* (Host) Runemark, *E. hispidus* (Opiz.) Melderis, *Festuca arundinacea* Schreb., *F. pallens* Host. subsp. *palens*, *F. pratensis* Huds. *F. rubra* L.*, Glyceria fluitans* (L.) R. Br., *Glyceria maxima* (Hartm.) Holmb., *Holcus lanatus* L.*, Hordeum marinum* Huds, *Lolium perenne* L., *L. temulentum* L. *Melica nutans* L., *M. transsilvanica* Schur, *Oreochloa disticha* (Wulfen) Link., *Secale strictum* C. Presl., *Sorghum halepense* (L.) Pers.
Good fodder species and resistant to phytoremediation are: *Agrostis stolonifera* L. *Festuca arundinacea* Schreb., *F. pratensis* Huds. *F. rubra* L.*, Holcus lanatus* L.*, Lolium perenne* L., etc.; these should not be used as animal feed.
It is necessary to have a very good knowledge of the environmental conditions of good fodder plants that resist very well at the contamination with heavy metals and reduce their concentration. The most important are: *Agropyron cristatum* (L.) Gaertn. subsp. *pectinatum* (M. Bieb.) Tzvelev, *Agrostis capillaris* L., *A. stolonifera* L., *Arrhenatherum elatius* (L.) J. Presl, *Bromus squarosus* L., *Cynodon dactylon* (L.) Pers., *Echinochloa crus-galii* (L.) Beauv., *Festuca arundinacea* Schreb., *F. pratensis* Huds., *F. rubra* L., *Holcus lanatus* L.*, Lolium perenne* L. *Phleum pratense* L., *Sorghum halepense* (L.) Pers.
There are rare and endemic species that are consumed by animals. Among the rare and fodder species there are: *Agrostis alpina* L., *A. moldavica* Dobrescu et Beldie, *Alopecurus laguriformis* Schur, *Festuca amethystina* L., *Festuca callieri* (Hack. ex St.-Yves), *Festuca nitida* Kit. subsp. *flaccida* (Schur) Markgr., *Hordeum bulbosum* L., *H. jubatum* L., *Phleum hirsutum* Honck. Endemic and fodder species are: *Alopecurus laguriformis* Schur, *Festuca carpatica* F. Dietr., *F. versicolor* Tausch. subsp. *dominii* Krajin, *Poa laxa* Haenke.

There are rare, little fodder plants, about which we have no information and which do not grow on lands intended for pastoral exploitation; these are: *Aegilops geniculata* (Roth), *A. lorentii* Hochst. *A. neglecta* Req. ex Bertol., *A. triuncialis* L., *Avena barbata* Pott ex Link, *B. scoparius* L., *Corynephorus canescens* (L.) P. Beauv. end *Secale strictum* C. Presl.
In this list there are only 4 medicinal species of which *Cynodon dactylon* (L.) Pers. end *Elymus repens* (L.) Gould are well known, the others, *E. hispidus* (Opiz.) Melderis end *Tragus racemosus* (L.) All. we rarely found them in the medical literature.

CONCLUSION

Plants with forage value in this family have long been studied by pratologists and botanists. We have identified studies on 97 species. This number does not correlate with their distribution in nature or in agriculture. Many common wild species have no forage value. A small number of species with very good forage value are used to feed indoor animals, but on land used as pasture, animals have access to much greater diversity. Plants that are very rich in fiber, old, toxic, or located in inaccessible places are not consumed by animals. We wanted to further determine the nutritional value of another species.
Many plants in this family are important for both the economy and ecology. So far, 62 species can be used for environmental protection and ecological restoration, 37 species for phytoremediation, and 3 species as bioindicators of pollutants. Shrubby and rhizomatous plants cover the soil very well, prevent erosion, and attract fauna. These plants are of remarkable importance for the eco-economy.
These plants have small green flowers grouped in spikes, but for decorative purposes we have identified studies and sometimes practical information on 85 species. Many are cultivated for dual purposes: ecological and decorative.
Very few species are important for medicine and food.
There are numerous rare plants in this family, but in our analysis they are few in number and unknown to the public, yet they may disappear with the destruction of the habitats in which they grow.
So far, over 50% of the Poaceae species in the country are used. We consider this to be a very large number. The other species unknown to the economy are of interest to the ecological economy, biodiversity, and environmental protection.

REFERENCES

1. Al-Snafi A.E. *Chemical constituents and pharmacological effects of Cynodon dactylon: A review*. IOSR Journal of Pharmacy, 2016, 6 (7, 2), 17-31.
2. Antosiewicz D.M., Escudé-Duran C., Wierzbowska E., Skłodowska A. *Indigenous plant species with the potential for the phytoremediation of arsenic and metals contaminated soil*. Water, Air, and Soil Pollution, 2008, 193, 197-210.
3. Ashokkumar K., Selvaraj K., Muthukrishnan S.D. *Cynodon dactylon (L.) Pers.: An updated review of its phytochemistry and pharmacology*. Journal of Medicinal Plants Research, 2013, 7 (48): 3477-3483.
4. Bergqvist C., Greger M. *In situ remediation of arsenic-contaminated sites*. In Phytostabilization of Arsenic I, 2014.
5. Dalmis R., Köktas Ş., Seki Y., Çağri Kilinç A. *Characterization of a new natural cellulose-based fiber from Hierochloe odorata*. Cellulose, 2020, 27, 127-139.
6. Davidson G., Gobin S.M. *Evaluation of ornamental grasses for the Northern Great Plains*. Journal of Environmental Horticulture, 1998, 16 (4): 218-229.
7. Dihoru G., Boruz V. *The list of main spontaneous medicinal plants from Romania*. Annals of the University of Craiova – Agriculture, Montanology, Cadastre Series, 2014, XLIV, 328-344.
8. Dihoru G., Negrean G. *Cartea roșie a plantelor vasculare din România*. Romanian Academy Publishing House, 2009.
9. Dushenkov S. *Trends in phytoremediation of radionuclides*. Plant and Soil, 2003, 249, 167-175.
10. Fernández S., Poschenrieder C., Marcenó C., Gallego J.R., Jiménez-Gámez D., Bueno A., Afif E. *Phytoremediation capability of native plant species living on Pb–Zn and Hg–As mining wastes in the Cantabrian range, north of Spain*. Journal of Geochemical Exploration, 2016, 174, 10-20.
11. Fiala K., Jakrlová J., Zeilená V. *Biomass partitioning in two Calamagrostis villosa stands of deforested sites*. Folia Geobotanica et Phytotaxonomica, 1989, 207-210.
12. Fritioff Å. *Metal accumulation by plants: Evaluation of the use of plants in stormwater treatment.* Stockholm University, 2005.
13. Gajbhiye R., Sarma S.S., Kumar D., Singh S. . *The treasure trove of the genus Carex: A phytochemical and pharmacological review.* Health Sciences Review, 2024, 10.
14. Gajić G., Mitrović M., Pavlović P. . *Ecorestoration of fly ash deposits by native plant species at thermal power stations in Serbia*. In *Phytomanagement of Polluted Sites*, 2019.
15. Gecheva G., Stankova S., Varbanova E., Kaynarova L., Georgieva D., Stefanova V. *Macrophyte-based assessment of upland rivers: Bioindicators and biomonitors.* Plants, 2023, 12 (6): 1366.

16. Hajnáczki S., Pajor F., Péter N., Bodnár Á., Penksza K., Póti P. *Solidago gigantea Ait. and Calamagrostis epigejos (L.) Roth invasive plants as potential forage for goats.* Notulae Botanicae Horti Agrobotanici Cluj-Napoca, 2021, 49 (1): 12197.
17. IUCN. (n.d.). The IUCN Red List of Threatened Species.
18. Jamnická G., Válka J., Bublinec E. *Heavy metal accumulation and distribution in forest understory herb species of Carpathian beech ecosystems.* Chemical Speciation & Bioavailability, 2015, 25 (3): 209-215.
19. Kang B.M., An B.K., Jung W.S., Jung H.K., Cho J.H., Cho H.W., Jang S.J., Yun Y.B., Kuk Y.I. *Anti-inflammatory effect of tricin isolated from Alopecurus aequalis Sobol.* International Journal of Molecular Medicine, 2016, 38, 1614-1620.
20. Katova A., Naydenova Y. *Chemical composition, digestibility and feeding value of accessions from genus Festuca.* Journal of Mountain Agriculture on the Balkans, 2017, 20 (3): 16-34.
21. Keskin M., Altay V., Öztürk M. *Traditional value of plants diversity of nutritional purposes: A case study from Istanbul (Turkey)*. In Öztürk M. et al. (Eds.), *Ethnic knowledge and perspectives of medicinal plants*, Vol. 2, 2024.
22. Khan M.A., Qaiser M. *Halophytes of Pakistan: Characteristics, distribution and potential economic usages*. In Khan M.A. et al. (Eds.), *Sabkha Ecosystems*, Vol. 2, 2006.
23. Khanbabayeva O.E., Kalashnikov D.V., Sorokopudov V.N., Sorokopudov O.A., Bamatov I.M. *Phytoremediation ability and decorative value of perennial herbaceous plants for landscaping coastal zones*. ASE-I, 2021, 2442, 1.
24. Khashij S., Karimi B., Makhdoumi P. *Phytoremediation with Festuca arundinacea: A mini review.* International Journal of Health and Life Sciences, 2018, 4 (2).
25. Kök A.B., Mungan M.D., Doğanlar S., Frary A. *Transcriptomic analysis of selenium accumulation in Puccinellia distans*. Chemosphere, 2020, 245.
26. Korzeniowska J., Stanislawska-Glubiak E. *The phytoremediation potential of local wild grass versus cultivated grass species for zinc-contaminated soil*. Agronomy, 2023, 13, 160.
27. Kovacs A. *Indicatorii biologici, ecologici şi economici ai florei pajiştilor*. Ministry of Agriculture and Food Industry, 1979.
28. Krems P., Rajfur M., Wacławek M., Kłos A. *The use of water plants in biomonitoring and phytoremediation of waters polluted with heavy metals*. Ecological Chemistry and Engineering S, 2013, 20 (2): 353-370.
29. Lehmann C., Rebele F. *Evaluation of heavy metal tolerance in Calamagrostis epigejos and Elymus repens.* Environmental and Experimental Botany, 2004, 51, 199-213.
30. Majeed M., Bhatti K.H., Amjad M.S., Abbasi A.M., Rashid A., Nawaz F., Mehmood A., Mahmood M. *Ethno-veterinary practices of Poaceae taxa in Punjab, Pakistan*. Research Square, 2020.
31. Maruşcă T. *Ecological reconstruction of degraded grasslands*. Transylvania University Press, 2008.
32. Maruşcă T. *Contributions to the evaluation of pasture productivity using the floristic relevé.* Romanian Journal of Grassland and Forage Crops, 2019, 19, 33-47.
33. Matache M.L., Marin C., Rozylowicz L., Tudorache A. *Plants accumulating heavy metals in the Danube River wetlands.* Journal of Environmental Health Science & Engineering, 2013, 11, 39.
34. Oakes A.J. *Ornamental grasses and grasslike plants.* Avi Book, 1990.
35. Oprea A. *Lista critică a plantelor vasculare din România/* Lista critică a plantelor vasculare din România. Editura Universităţii „A.I. Cuza", 2005.
36. Osmonali B., Tokbergenova A., Taukebayev O., Zulpykharov K., Salmurzauly R., Smanov Z., Ussen S. *Weed species as indicators of degradation in desert regions.* Biodiversitas, 2024, 25 (12): 4930-4938.
37. Pârvu C. Encyclopedia of plants / *Enciclopedia plantelor*. Technical Publishing House, Bucureşti, 2000-2004.
38. Paszkiewicz-Jasińska A., Wróbel B., Stopa W., Jakubowska Z., Steinhoff-Wrześniewska A., Zielewicz W. *Nutritional status of Melica uniflora in a natural forest stand.* Forests, 2023, 14.
39. *Plants for a Future.* PFAF database, 2012-2022.
40. *Plants of the World Online (POWO).* 2025. Retrieved from https://powo.science.kew.org
41. Pop I. *Plante spontane şi subspontane cu valoare economică din flora R. S. România.* Contrib. Bot, Cluj Napoca, 1982, 131-142.
42. Poveda J. *The use of freshwater macrophytes as a resource in sustainable agriculture.* Journal of Cleaner Production, 2022, 369.
43. Preda M. *Dicţionar dendrofloricol.* Scientific and Encyclopedic Publishing House, Bucureşti, 1989.
44. Qayoom I., Jaies I. *Phytoremediation potential of macrophytes against heavy metals, nitrates and phosphates.* Environment Conservation Journal, 2022, 24 (1): 273-280.
45. Rahman M.A., Hasegawa H. *Aquatic arsenic: Phytoremediation using floating macrophytes.* Chemosphere, 2011, 83, 633-646.
46. Rai P.K. *Heavy metal phytoremediation from aquatic ecosystems with special reference to macrophytes.* Critical Reviews in Environmental Science and Technology, 2009, 39, 697-753.
47. Rezania S., Park J., Rupani P.F., Darajeh N., Xu X., Shahrokhishahraki R. *Phytoremediation potential and control of Phragmites australis.* Environmental Science and Pollution Research, 2019, 26, 7428-7441.
48. Rezvani M., Zaefarian F. *Bioaccumulation and translocation factors of cadmium and lead in Aeluropus littoralis.* AJAE, 2011, 2 (4): 114-119.
49. Rodrigues M.J., Custódio L., Mecha D., Zengin G., Cziáky Z., Sotkó G., Pereira C.G. *Nutritional and phytotherapeutic value of Cladium mariscus.* Plants, 2022, 11, 2910.
50. Roj-Rojewski S., Wysocka-Czubaszek A., Czubaszek R., Kamocki A., Banaszuk P. *Anaerobic digestion of wetland biomass.* Biomass and Bioenergy, 2019, 122, 126-132.
51. Rowell T.A. *Cladium mariscus in Cambridgeshire: Its use since the 17th century.* The Agricultural History Review, 1986, 34 (2): 140-148.

52. Rudescu L., Niculescu C., Chivu I. P. *Monografia stufului din Delta Dunării*. Bucharest: Romanian Academy Publishing House, 1965.
53. Sârbu I., Ștefan N., Oprea A. *Plante vasculare din România.* Victor B. Victor Publishing House, București, 2013.
54. Sarma H. (2011). *Metal hyperaccumulation in plants: A review focusing on phytoremediation technology.* Journal of Environmental Science and Technology, 2011, 4 (2): 118-138.
55. Săvulescu T. (Ed.). *Flora R.P.R./R.S. România*. Bucharest: Romanian Academy Publishing House, 1952-1976.
56. Sierka E., Kopczyńska S. *Participation of Calamagrostis epigejos in plant communities of the Bytomka valley.* Environmental Socio-economic Studies, 2014, 2 (2): 38-44.
57. Song X., Li C., Chen W. *Phytoremediation potential of Cynodon dactylon in soils co-contaminated with PAHs and cadmium.* Ecotoxicology and Environmental Safety, 2022, 234.
58. Soreng R.J., Peterson P.M., Zuloaga F.O., Romaschenko K., Clark L.G., Teisher J.K., Gillespie L.J., Barberá P., Welker C.A.D., Kellogg E.A., Li D.Z., Davidse G. *A worldwide phylogenetic classification of the Poaceae (Gramineae) III.* Journal of Systematics and Evolution, 2022, 58 (4): 1-35.
59. Srivastava S., Shukla A., Rajput V.D., Kumar K., Minkina, Mandzhieva S., Shmaraeva A., Suprasanna P. *Arsenic remediation through sustainable phytoremediation approaches.* Minerals, 2021, 11, 936.
60. Steliga T., Kluk D. *Application of Festuca arundinacea in phytoremediation of soils contaminated with Pb, Ni, Cd, and petroleum hydrocarbons.* Ecotoxicology and Environmental Safety, 2020, 194.
61. Sun N.C., Lee M.J., Su H.S., Choi Y.H., Lee J.E., Park S.Y., Lee Y.H., Hong S.H. *Antioxidant and neuroprotective activity of aerial parts of Eragrostis species.* Records of Natural Products, 2018, 12 (1): 101-106.
62. Teodoro M., Hejcman M., Vítková M., Wu S., Komárek M. *Seasonal fluctuations of heavy metals in grasses growing on contaminated soils.* Science of the Total Environment, 2020, 703: 134710.
63. Terrell E.E. *A checklist of names for 3,000 vascular plants of economic importance.* Agriculture Handbook No. 505, 1977.
64. Tiwari S. *Plants: A rich source of herbal medicine.* 2008, 1, 27-35.
65. Török A., Gulyás Z., Szalai G., Kocsy G., Majdik C. *Phytoremediation capacity of aquatic plants is associated with phytochelatin polymerization.* Journal of Hazardous Materials, 2015, 299, 371-378.
66. Török P., Deák B., Vida E., Valkó O., Lengyel S., Tóthmérész B. *Restoring grassland biodiversity.* Biological Conservation, 2010, 143, 806-812.
67. Visconti D., Álvarez-Robles M.J., Fiorentino N., Fagnano M., Clemente R. *Use of Brassica juncea and Dactylis glomerata for phytostabilization of mine soils.* Chemosphere, 2020, 260.
68. Yadav K.K., Gupta N., Kumar V., Singh J.K. *Bioremediation of heavy metals using potential plant species: A review.* IJEP, 2017, 37 (1): 65-84.