DESIGN AND ESTABLISHMENT OF HERBACEOUS PLANTINGS IN RURAL ENVIRONMENTS AND THEIR CONTRIBUTIONS TO PUBLIC SPACE QUALITY

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Abstract
Rural public spaces in Slovakia have undergone significant transformations in recent decades, often disrupting their traditional character and landscape identity. Appropriately designed vegetation represents an important tool for restoring the aesthetic, ecological, and cultural values of rural settlements. This study focuses on the role, functions, and potential applications of herbaceous plantings in rural environments and highlights their ecological, aesthetic, and social benefits. The paper also identifies common shortcomings in the management of rural greenery, including the absence of conceptual planning, the use of unsuitable plant assortments, and insufficient professional involvement in the design of public spaces. It presents a categorization of greenery within the built environment and discusses the specific characteristics of working with perennials and annual plants. In addition, suitable species for different site conditions are recommended, with particular emphasis on the use of local and traditional taxa. Herbaceous plantings contribute significantly to increasing biodiversity, supporting natural ecosystems, improving rainwater retention, and strengthening the identity of rural landscapes. The study ultimately emphasizes the importance of a professional and context-sensitive approach that respects local environmental conditions and cultural specificities to create sustainable, functional, and visually high-quality rural public spaces.

Key words: herbaceous plant communities; planting design; landscape architecture; urban biodiversity; rural environments

Introduction

Vegetation represents a key tool in spatial formation, extending beyond mere ground coverage to actively influence spatial structure, legibility, and use. Through planting design, space can be differentiated, movement can be guided, and visual relationships can be established. Thus, planting design integrates both aesthetic and spatial-forming functions (Vinczeová, Tóth, 2025; Kuczman et al., 2024; Tóth, Slobodníková, 2025).

Inspiration derived from natural plant communities, such as meadows, steppes, and prairies, is common in contemporary design practice. However, inappropriate application may result in homogeneous and visually monotonous compositions. For this reason, it is essential to apply principles of scale, rhythm, and contrast, which ensure visual variability and long-term attractiveness of plantings (Hus, Pástorová, 2025; Bellérová, Hus, 2025; Rózová, Pástorová, Kuczman, 2023). The design of vegetation elements is based on a comprehensive methodological approach, including site and user analysis, spatial composition design, definition of functional elements, and selection of appropriate plant species. Emphasis is placed on respecting ecological conditions, functional requirements, and the overall sustainability of the solution (Dunnett, Hitchmough, 2007; Dunnett, 2019; Rózová, Turanovičová, Tóth, 2020). Contemporary approaches to planting establishment reflect the need for environmentally sensitive solutions, including minimizing soil disturbance, utilizing organic materials, and supporting natural processes. Such plantings contribute to the stability of urbanized ecosystems.

Plantings also fulfill important aesthetic and psychological functions. Their acceptance by the public is crucial for long-term sustainability; therefore, user preferences must be considered. Nature-based plantings offer dynamism and support biodiversity, whereas traditional compositions provide a higher degree of legibility and order (Oudolf a Kingsbury, 2013; Baroš a Martinek, 2018; Hillová, et al., 2016; Hus, Saková, 2025). The contemporary concept of “enhanced nature” integrates ecological and aesthetic principles through vegetation layering, the use of native species, and the promotion of natural dynamics within plant communities (Dunnett, 2019). Lindemann-Matthies and Brieger (2016) state that, in addition to wildflower meadows, flower beds are among the preferred measures for enhancing the aesthetic value of urban green spaces. These elements can significantly contribute to the visual attractiveness of the environment, particularly in urbanized areas. Moreover, flower beds can be effectively implemented in small-scale sites (e.g., roundabouts or green strips along roads), where the use of wildflower meadows is less suitable. It is also important to note that the public may

perceive spontaneously growing vegetation as aesthetically unmaintained and less attractive, especially at the end of the life cycle of annual species. In contrast, flower beds combining ornamental and native perennials can ensure stable ground cover even in limited spaces. Their morphological and color diversity further enhances their attractiveness to pollinators. Additionally, year-round ground cover provided by ornamental perennials suppresses weed growth, thereby contributing to reduced maintenance and vegetation management costs (Pomatto, 2023). The aim of the paper was to propose and analyse various scenarios for the application of herbaceous vegetation elements in rural environments with respect to different spatial uses.

Materials and method

The methodological approach was focused on the design and application of measures (scenarios) aimed at enhancing the aesthetic and ecological quality of rural spaces. Within this framework, vegetation elements with the potential to enrich the rural landscape through visually attractive and ecologically functional components were identified and analysed. The methodological procedure was based on the selection of appropriate planting types and vegetation elements, with emphasis placed on their compositional, ecological, and functional characteristics. During their application, particular attention was given to the preservation of regional landscape character, the promotion of biodiversity, and the restoration of traditional forms of greenery typical of rural environments.

The methodological framework included the following types of vegetation elements:

- group-composed perennial beds,
- loose mixed perennial plantings,
- monocultural perennial plantings,
- annuals established by direct sowing,
- traditional annual flower beds,
- flowering meadows,
- solitary trees,
- combinations of woody plants and herbaceous species.

In the design of vegetation plantings, general design principles were applied in combination with the morphological and growth characteristics of plants. The key factors influencing the resulting composition included plant height, colour, structure, and vegetation dynamics. The implementation of these elements was evaluated in terms of their contribution to enhancing the aesthetic value of the environment as well as strengthening the ecological stability of the area. The methodology was based on nature-based design principles and integrated both traditional and contemporary approaches to the creation of vegetation elements in rural landscapes.

Results

The practical part of the study focuses on specific vegetation measures that enhance public spaces through the integration of appropriate green infrastructure elements. These include a set of design proposals consisting of herbaceous plants, woody species, and their combinations, all of which provide significant ecological and aesthetic benefits for rural landscapes. The proposed measures also reflect the current needs and development opportunities of rural environments in the 21st century.

Group-composed perennial bed

This represents a long-term vegetation element based on a predefined planting scheme that enables the creation of a structured and deliberate composition. The planting consists of multiple plant species arranged in larger, clearly defined groups. Their combination results in a strong and visually distinctive effect.

Loose mixed perennial bed This type also represents a long-term vegetation element, with the aim of approximating a naturalistic planting character. The composition is species-rich and emphasizes diversity. During implementation, a fixed planting plan is not strictly required, as the designer may arrange plants intuitively, combining solitary species with group plantings, ground-cover species, scattered individuals, as well as bulbous and tuberous plants.

Monocultural perennial planting This type of planting consists of a single plant taxon, resulting in a simple and visually calm composition. The overall effect depends on whether the planting is designed as point-based or large-scale. This approach is less demanding in terms of design and implementation; however, over time it may appear monotonous and can lead to rapid visual saturation.

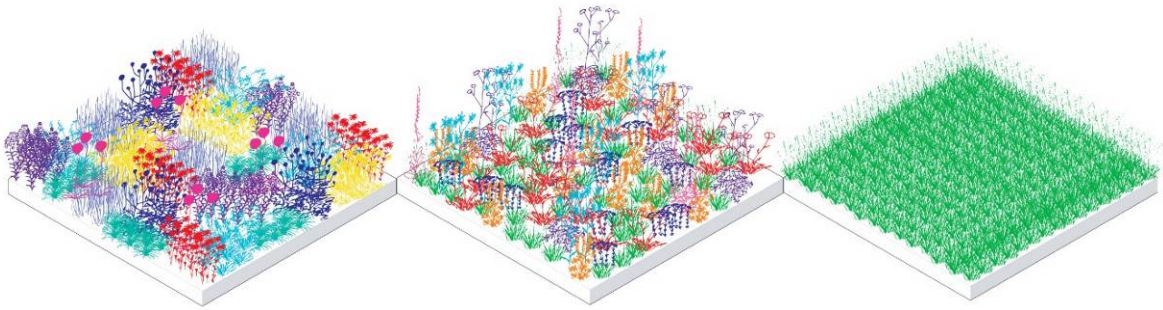

Fig. 1: Possible applications of perennial plants in rural environments in different compositional arrangements- group-composed perennial bed (left), loose mixed perennial bed (in the middle), monocultural perennial planting (right)(Pilarčík, 2025).

Annual bed established by direct sowing This represents a short-term vegetation measure composed of dicotyledonous flowering herbs without the presence of grasses, characterized by a strong visual effect. It serves as an alternative to traditional annual beds established through planting. Its advantages include a dynamic, naturalistic appearance, simple and rapid establishment even on lower-quality soils, and relatively low maintenance requirements.

Traditional annual bed Annual beds are renewed each year and represent a short-term vegetation element within the overall composition. True annuals complete their life cycle within a single growing season and die after flowering. In contrast, tender perennials (so-called “false annuals”) do not naturally die but are unable to survive winter conditions in temperate climates. The final appearance of these beds varies depending on the design concept, establishment technique, and level of maintenance.

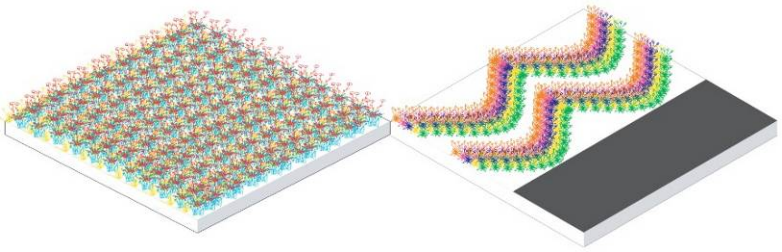

Fig. 2: Use of annual herbaceous plants in rural landscape design- annual bed established by direct sowing (left), traditional annual bed (right) (Pilarčík, 2025).

Grasses

Grasses represent the most extensive and commonly used green surface in public spaces. Several types can be distinguished depending on their function and intended use. During summer months, lawns exhibit significantly lower surface temperatures compared to impervious surfaces, thereby contributing to the reduction of urban heat. They also enable natural water retention, infiltration, and evapotranspiration, which improves local microclimatic conditions.

Flower meadow This type of vegetation consists predominantly of grasses with varying proportions of herbaceous species, particularly botanically valuable taxa. It is commonly used to simulate natural or semi-natural meadow communities and contributes to increased biodiversity as well as the enhancement of the natural character of the landscape.

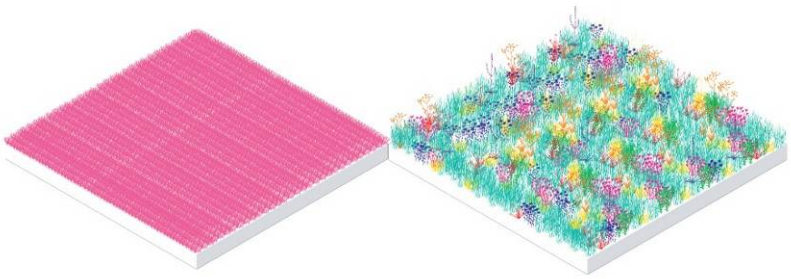

Fig. 3: Use of a herb community- grasses (left), flower meadow (right) (Pilarčík, 2025).

Planting in mobile containers Containers designed for planting can take various forms and allow for the use of a wide range of herbaceous and woody species, including their combinations. Depending on the selected plant material, these vegetation elements may be temporary, perennial, or movable. They represent a functional technical solution that enables the introduction of greenery in locations where conventional planting is not feasible.

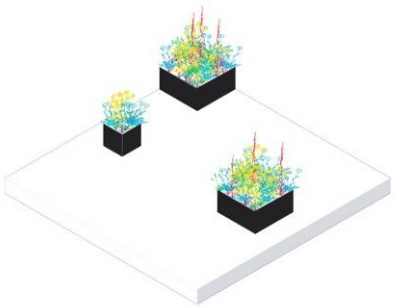

Fig. 5: Use of herbaceous plants in combination with technical elements- mobile containers (Pilarčík, 2025).

Discussion

Herbaceous plantings represent a current and relevant approach to greenery management in rural environments, both in central and peripheral areas. Village centres, as the most frequently visited and intensively used spaces, are required to meet specific aesthetic and functional standards while also providing representative and recreational environments (Balko, 2017; Čibik, 2024). The increasing concentration of users in limited public spaces places growing demands on the quality of these areas. Consequently, green public spaces must offer a high level of aesthetic experience and functional value (Oudolf, Gerritsen, 2013). Herbaceous plantings based on plant communities primarily focus on ground coverage and the selection of species to create a coherent composition. However, this approach needs to be extended by incorporating spatial design considerations. Plantings should not merely fill empty spaces but actively shape, structure, and define spatial identity (Dunnett, 2019). Therefore, the objective of design should extend beyond visual appearance to the creation of an authentic spatial atmosphere. In the design of herbaceous plantings, their aesthetic function must be carefully considered, as it often represents the primary motivation for their implementation (Baroš, Martinek, 2018). Plant combinations should not be random; instead, they should be deliberately selected to reflect user preferences while maintaining rhythm and compositional unity (Oudolf, Kingsbury, 2013). In this way, planting design creates not only a visual effect but also an emotional connection between people and space. For these reasons, it is essential that vegetation measures are systematically implemented in rural public spaces. They contribute not only to improving the quality of life of residents but also to enhancing the visual character of rural environments and strengthening their connection with the surrounding landscape. Vegetation thus plays a key role in shaping public space—not merely as a complement to architecture, but as an active and defining element. In conclusion, herbaceous plantings can be considered an effective tool for addressing the challenges of contemporary rural planning, with the potential to significantly improve the quality, identity, and ecological as well as social value of rural settlements.

Conclusion

Herbaceous plantings represent an effective tool for improving the quality of rural public spaces in Slovakia by enhancing their ecological, aesthetic, and social functions. The study confirms that appropriately designed vegetation can contribute to biodiversity support, microclimate regulation, and the restoration of local landscape identity. At the same time, it highlights the importance of a systematic and professional approach that integrates ecological conditions, spatial composition, and user needs. The application of context-sensitive and nature-based design principles is essential for creating sustainable, functional, and visually coherent rural environments.

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Souhrn
Venkovské veřejné prostory na Slovensku prošly v posledních desetiletích významnými proměnami, které často narušily jejich tradiční charakter a krajinnou identitu. Odborně navržená zeleň představuje důležitý nástroj pro obnovu estetických, ekologických a kulturních hodnot venkovských sídel. Tato studie se zaměřuje na roli, funkce a možné využití bylinných výsadeb ve venkovském prostředí a zdůrazňuje jejich ekologické, estetické a sociální přínosy. Článek také identifikuje běžné nedostatky v péči o venkovní zeleň, včetně absence koncepčního plánování, používání nevhodných druhových skladeb a nedostatečného zapojení odborníků do navrhování veřejných prostor. Představuje kategorizaci zeleně v zastavěném prostředí a diskutuje specifické charakteristiky práce s trvalkami a jednoletými rostlinami. Dále doporučuje druhy vhodné pro různé podmínky stanovišť, se zvláštním důrazem na využití místních a tradičních taxonů. Bylinné výsadby významně přispívají ke zvyšování biodiverzity, podpoře přírodních ekosystémů, zlepšování zadržování dešťové vody a posilování identity venkovské krajiny. Studie nakonec zdůrazňuje význam profesionálního a kontextově citlivého přístupu, který respektuje místní environmentální podmínky a kulturní specifika, s cílem vytvořit udržitelné, funkční a vizuálně kvalitní venkovské veřejné prostory.

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