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Assessment of the introduction success and prospects of use of *Verbena* (Verbenaceae) species in Ukraine

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Abstract

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This study presents the results of investigating the morphological and biological characteristics of 11 ornamental species of the genus *Verbena* L. under introduction conditions in the forest–steppe zone of Ukraine at the M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine, and evaluates their potential for use in landscaping. The species differed in height, habit, and corolla colouration, formed two phenorhythmic groups, completed a full annual cycle as therophytes, and flowered for 60–120 days. Introduction success was assessed using a 4-point scale. Ornamental traits were evaluated in terms of corolla colourfastness, total number of flowers per plant, flowering abundance, and plant habit; biological characteristics were assessed in terms of flowering duration, reproductive capacity, drought and cold tolerance, and resistance to pests and diseases. Ornamental traits scored 8–12 out of 12 possible points, and biological traits scored 10–16 out of 16 possible points. All species demonstrated high drought and cold tolerance as well as strong resistance to pests and diseases. Based on a comprehensive assessment, *Verbena bracteata* Cav. ex Lag. & Rodr., *Verbena canadensis* (L.) Britton, *Verbena bonariensis* L., *Verbena rigida* Spreng., *Verbena tenera* Spreng., and *Verbena tenuisecta* Briq. were identified as highly promising, whereas *Verbena hastata* L., *Verbena elegans* Kunth, *Verbena stricta* Vent., *Verbena laciniata* (L.) Britton and *Verbena urticifolia* L. were recognised as promising for landscape design.

Keywords: biological traits, drought tolerance, introduction success, morphological features, ornamental traits, phenology, Ukraine.

INTRODUCTION

Under contemporary conditions of global climate change, characterised by rising temperatures and an increasing frequency of drought events, the expansion and enrichment of ornamental plant species capable of ensuring sustainable landscape greening is becoming increasingly important (Mazur et al., 2018; Rakhmetov et al., 2020; Wilson, 2021). In this context, species of the genus *Verbena* L. (Verbenaceae) represent a promising group due to their pronounced drought tolerance, ecological plasticity, and extended flowering period (Wang et al., 2018; Yuan & Olmstead, 2008).

The genus *Verbena* comprises approximately 150 species distributed across several continents, with the

highest species richness in North and South America (Anton et al., 2012; Brickell, 2008; Cardoso et al., 2021; POWO, 2025). Most representatives of the genus inhabit tropical and subtropical arid regions and are commonly found in dry, open, and well-illuminated habitats such as roadsides, wastelands, and various anthropogenic plant communities (Chayka & Dziuk, 2025; Yatskievych, 2013).

The natural flora of Ukraine comprises two species, *Verbena officinalis* L. and *Verbena supina* L.; however, neither possesses ornamental value (Mosyakin & Fedoronchuk, 1999). For this reason, the M.M. Gryshko National Botanical Garden (Forest-Steppe zone of Ukraine) has initiated the introduction and evaluation of ornamental *Verbena* species originating from North America (*Verbena bracteata*, *Verbena canadensis*, *Verbena elegans*, *Verbena urticifolia*, *Verbena rigida*, *Verbena stricta*, *Verbena tenera*, *Verbena tenuisecta*) and South America (*Verbena bonariensis*, *Verbena hastata*, *Verbena laciniata*). These species are characterised by high levels of drought and stress tolerance, as well as considerable ornamental appeal (Mashkovska & Marynenko, 2018; Turner, 1999; Yatskievych, 2013).

Scientific studies on the genus *Verbena* encompass morphological, taxonomic, and phylogenetic aspects. Diagnostic characters, identification keys, and detailed illustrations for numerous species have been thoroughly documented, providing a solid foundation for systematic and comparative research (Marx et al., 2010; Nesom, 2010; O'Leary et al., 2010).

Comprehensive investigations of the systematics of the family Verbenaceae have refined generic boundaries, identified key morphological synapomorphies, and clarified evolutionary relationships, all of which are essential for selecting species with high adaptive capacity and ornamental potential (Atkins, 2004; Nesom, 2010).

Based on morphological and anatomical studies, the variability of generative and vegetative organs has been described in several North and South American species (*Verbena rigida*, *Verbena bonariensis*, *Verbena intermedia* Schauer). Significant interspecific differences have been identified in trichome types, inflorescence structure, and floral morphology. These traits determine taxonomic differentiation, ecological plasticity, and the potential for successful introduction (Souza & Giulietti, 1999). The results of studies on inflorescence development and structural diversity have further deepened the understanding of reproductive strategies that influence adaptability and ornamental value (O'Leary et al., 2007).

Molecular phylogenetic studies have clarified relationships among closely related *Verbena* species, providing a robust foundation for the informed selection of species in horticulture and ecological programmes (Yuan & Olmstead, 2008). These studies have revealed discrepancies between traditional morphological classifications of Verbenaceae and the actual evolutionary relationships, prompting the development of a more accurate and stable taxonomic framework for identifying promising taxa (Wagstaff & Olmstead, 1997; Marx et al., 2010; Munir, 2002).

The synonymy, typifications, and species boundaries within the genus *Verbena* have been revised, resolving long-standing nomenclatural inconsistencies and creating a reliable basis for introduction and breeding efforts (O'Leary et al., 2010).

Despite the available research, information on the introduction and adaptation of ornamental *Verbena* species remains insufficient. The scientific literature lacks data on the development characteristics of *Verbena* species under new cultivation conditions, as well as comprehensive assessments of introduction success, ornamental potential, ecological tolerance, and species invasiveness. Most studies focus on isolated aspects of phenology, morphological variation, or ornamental traits of only one species, the most widely used in ornamental horticulture, *Verbena* × *hybrida* Groenland & Rümplerand its cultivars (Zyman et al., 2004; Bejdman, 1974). This results in substantial gaps in comparative analyses of the morphological, biological, and ornamental characteristics of different species and complicates the informed selection of *Verbena* species for landscape plantings under conditions of climate change.

The aim of this study was to assess the success of introducing ornamental *Verbena* species under conditions at the M.M. Gryshko National Botanical Garden (Forest-Steppe zone of Ukraine) and to evaluate their prospects for sustainable landscape use. To achieve this aim, the following objectives were set: (1) to investigate the morphological and biological characteristics of *Verbena* species under introduction, including growth parameters, stem growth patterns, habit type, life forms, and phenological development

stages; (2) to perform a comparative assessment of ornamental traits of the introduced species under the natural climatic conditions of the Forest-Steppe zone of Ukraine, including corolla colour stability, flowering abundance, and habit characteristics; (3) to evaluate key biological traits determining introduction success, such as flowering duration, reproductive capacity, drought tolerance, frost resistance, and resistance to pests and diseases; (4) to calculate an integrated index of introduction success and classify species according to their suitability for landscaping purposes.

MATERIALS AND METHODS

The research was conducted in the Forest-Steppe zone of Ukraine on the experimental plots of the M.M. Gryshko National Botanical Garden of the National Academy of Sciences of Ukraine from 2015 to 2021. Eleven species of the genus *Verbena* from the collection of annual ornamental plants were included in the introduction assessment. The plants were cultivated using the seedling method. Seeds were stratified before sowing, and seedlings emerged within 10–15 days. Once two pairs of true leaves had developed, the seedlings were transplanted (with apical root pruning) and placed 5–7 cm apart in the greenhouse. In the second or third week of May, the plants were transplanted to open-field experimental plots with a spacing of 25–30 cm between individuals. Life forms were classified according to the Serebryakov (1964) and Raunkiaer (1934), morphological traits were described following Zyman et al. (2004), and phenological observations were conducted using Beideman's method (1974), with adjustments for dicotyledonous plants (Bejdman, 1974; Meier, 2018; Raunkiaer, 1934; Serebryakov, 1964). The onset and end dates of each phenophase were averaged across the six years of observations.

Five distinct and prolonged phases were identified in the plant development cycle: vegetative growth, budding, flowering, fruiting, and senescence. The vegetative period began when sprouts appeared, and cotyledons became visible on the soil surface in 15% of plants. The end of the vegetative phase was determined when more than 75% of the vegetative organs dried and died. Budding began with the appearance of flower buds on generative shoots in 10% of plants and ended when no new buds were formed, while existing buds had not yet opened.

Flowering began when 10% of the plants first opened flowers. Mass flowering was recorded when 75% of plants were in bloom. The end of flowering was determined when petals had fallen in more than 80% of the plants, the flowers wilted, and no new flowers were forming. Fruiting started when 10% of the fruits reached their final size and ended when the fruits could be easily detached from the parent plant.

The integrated assessment of introduction success was carried out using the modified method by Bylov and Karpisonova (1978), adapted for the genus *Verbena* (Bylov & Karpisonova, 1978). Individual traits were evaluated on a 4-point scale, where zero indicated absence or minimal expression, and three represented maximum expression (Table 1).

Ornamental traits were assessed during mass flowering using four parameters: flower colour, total number of flowers per plant, flowering abundance, and plant habit. The maximum score for ornamental traits was 12 points.

Species that received eight or more points were additionally evaluated for biological characteristics, including flowering duration, reproductive capacity, resistance to pests and diseases, and tolerance to adverse conditions such as drought and cold. The maximum score for biological traits was 16 points. The overall introduction success score was calculated as the sum of ornamental and biological trait scores.

Based on the integrated assessment, species were assigned to one of five suitability classes for large-scale use in landscaping:

Highly promising (HP; 22–28 points)
Promising (P; 17–21 points)
Low-promising (LP; 12–16 points)
Unpromising (UP; 7–11 points)
Unsuitable (US; 0–6 points).

RESULTS

The morphobiological traits (plant height and width, stem growth type, habit characteristics, and flower colour) of plants play a crucial role in their selection for landscape design and floristic projects. Therefore, we used these traits to compare the characterisation of *Verbena* species (Table 2).

Among the studied *Verbena* species, three groups

Table 1. Scale for assessing the ornamental and biological traits of species of the genus *Verbena* L.

Traits	State of the trait	Score
Ornamental		
Stability of corolla colour	colour fully retained; unaffected by rain and (or) sun	3
	> 50% flowers retain colour	2
	< 50% retain colour	1
	complete colour loss	0
Total number of flowers per plant	> 100	3
	50–99	2
	10–49	1
	< 10 or none	0
Flowering abundance	> 70 flowers open simultaneously	3
	40–69	2
	10–39	1
	< 10	0
Plant habit	dense, columnar	3
	intermediate	2
	loose, sprawling, partly collapsing	1
	very loose, collapsing completely	0
Biological		
Flowering duration	100–120 days	3
	80–99	2
	60–79	1
	< 60	0
Reproductive ability	sufficient seeds; laboratory germination 80–100%; field germination > 50%	3
	adequate seeds; laboratory germination 50–79%; field germination 30–49%	2
	few seeds; laboratory germination 30–49%; field germination 10–39%	1
	no fruits or seeds	0
	if self-sowing occurs	+1
Drought resistance	no stress; full recovery	3
	slight wilting; fast recovery	2
	partial wilting; slow recovery	1
	severe wilting; growth sharply reduced	0
Cold resistance	survives 0 °C or -2 °C; growth continues	3
	survives 0 °C; slight damage	2
	noticeable damage at 0 °C	1
	severe damage, the plants are perishing at 0 °C	0
Resistance to pests/diseases	none affected	3
	≤ 20% affected	2
	21–50%	1
	> 50%	0

were identified based on height: short (up to 40 cm), medium-sized (40–80 cm), and tall (above 80 cm); width: weakly spreading (less than 40 cm), medium-spreading (40–60 cm), and vigorously spreading (more than 60 cm); and habit shape: columnar, spreading, or intermediate between columnar and spreading.

Tall species include *Verbena bonariensis*, *Verbena hastata*, and *Verbena stricta*. Medium-sized species include *Verbena elegans*, *Verbena rigida*, and *Verbena urticifolia*. Short species include *Verbena bracteata*, *Verbena canadensis*, *Verbena laciniata*, *Verbena tenuisecta*, and *Verbena tenera*.

Weakly spreading species include *Verbena bracteata* and *Verbena urticifolia*. Medium-spreading species include *Verbena hastata*, *Verbena stricta*, *Verbena laciniata*, *Verbena tenera*, and *Verbena tenuisecta*. Vigorously spreading species include *Verbena canadensis* and *Verbena bonariensis*.

Table 2. Morphobiological traits of introduced species of the *Verbena* L. genus. *Habit shape: S – spreading, C – columnar, SC – transitional type between spreading and columnar

Species	Height (cm)	Width (cm)	Stem type according to the nature of growth	*Habit	Flower colour
Verbena bracteata	30–40	30−40	lying, creeping	S	blue, purple, lavender, mauve, pink-purple
Verbena canadensis	30−40	60−90	ascending	S	blue, pink, purple, white
Verbena hastata	60−100	30−60	upright	C	blue, magenta, violet
Verbena elegans	50−60	30−40	upright	S	purple, pink, lilac, white
Verbena stricta	60−90	45−60	upright	C	violet blue
Verbena urticifolia	45−65	30−40	upright	SC	white
Verbena bonariensis	90−120 (200)	50−90	upright	S	blue, violet, purple
Verbena laciniata	30−40	50−60	lying, creeping	S	red-purple, lavender-blue
Verbena rigida	30−60	40−50	ascending	SC	purple, lilac-pink
Verbena tenera	30−40	40−60	ascending, creeping	S	pinkish purple
Verbena tenuisecta	25−30	45−60	ascending, creeping	S	mauve, pink, blue, purple, violet, white

Low-growing plants (*Verbena bracteata*, *Verbena canadensis*, *Verbena laciniata*, *Verbena tenuisecta*, *Verbena tenera*) have a sprawling habit, making them suitable for use as ground cover species. Medium-growing species demonstrate three types of habits: sprawling (*Verbena elegans*), columnar (*Verbena stricta*), and intermediate (*Verbena urticifolia* and *Verbena rigida*). Tall species have either a sprawling (*Verbena bonariensis*) or columnar (*Verbena hastata*) habit.

Among the introduced species, there are plants with erect stems (*Verbena hastata*, *Verbena elegans*, *Verbena stricta*), erect and spreading stems (*Verbena bonariensis*, *Verbena urticifolia*), spreading and ascending stems (*Verbena rigida*), creeping and spreading stems (*Verbena canadensis*, *Verbena tenuisecta*, *Verbena tenera*), and prostrate and spreading stems (*Verbena bracteata*, *Verbena laciniata*).

In the studied species, the corollas are predominantly shades of blue-violet. There are also species with blue, pink-purple, lilac, or white flowers. However, not all species retain a stable colouration throughout the mass-flowering period. Under intense sunlight, the petals lose saturation and appear noticeably paler.

The ability to maintain flower colour is one of the key indicators of a plant's ornamental value. According to our observations, the colour of flowers remained stable in *Verbena bracteata*, *Verbena hastata*, *Verbena elegans*, *Verbena stricta*, *Verbena bonariensis*, and *Verbena rigida*. In contrast, in *Verbena canadensis*, *Verbena urticifolia*, *Verbena laciniata*, *Verbena tenera*, and *Verbena tenuisecta*, the intensity of petal colouration decreased in 30–40% of flowers as a result of exposure to sunlight.

When designing landscape compositions, not only the biometric parameters of flowering and ornamental plants but also their vegetation and flowering periods, defined by their phenorhythms, are considered.

According to long-term phenological observations (Table 3), the studied species, based on their phenorhythm type and seasonal growth dynamics, belong to the group of spring–summer-green species (*Verbena bracteata*) and spring–summer–autumn-green species (all other taxa). Under introduction conditions, most species continue vegetating until the onset of stable sub-zero temperatures, which, depending on the year, occurred from mid-November to early December.

The shortest growing season is characteristic of *Verbena bracteata* and *Verbena elegans*, lasting up to 170 and 180 days, respectively. In *Verbena laciniata* and *Verbena stricta*, the growing season extends to about 190 days, while in *Verbena hastata* and *Verbena canadensis* it reaches approximately 200 and 210 days, respectively.

Based on their flowering period, species of the genus *Verbena* can be classified into summer-flowering species (*Verbena bracteata*) and summer–autumn-flowering species (all other taxa). The flowering phase in the studied species lasts from 60 to 120 days. According to its duration, we identified three groups:

1. Short flowering period (60–70 days): *Verbena rigida*, *Verbena laciniata*, *Verbena stricta*, *Verbena urticifolia*.

Table 3. Phenological features of introduced species of the genus *Verbena*: 1 – the first 10 days of a month, 2 – the middle 10 days of the month, 3 – the last 10 days of the month. Phenological phases:

– growth, – budding, – flowering, – fruiting, – dying of plants

Species	Months																					
	Mar		Apr			May			Jun			Jul			Aug			Sep			Oct		
	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Verbena bracteata																							
Verbena bonariensis																							
Verbena canadensis																							
Verbena elegans																							
Verbena hastata																							
Verbena laciniata																							
Verbena rigida																							
Verbena stricta																							
Verbena tenera																							
Verbena tenuisecta																							
Verbena urticifolia																							

2. Medium flowering period (80–90 days): *Verbena bracteata*, *Verbena canadensis*, *Verbena hastata*, *Verbena elegans*, *Verbena tenera*.

3. Long flowering period (100–120 days): *Verbena bonariensis*, *Verbena tenuisecta*.

In most species (*Verbena canadensis*, *Verbena laciniata*, *Verbena stricta*, *Verbena tenera*, *Verbena urticifolia*), flowering occurs from July to September. Late-flowering species include *Verbena bonariensis*, *Verbena hastata*, and *Verbena tenuisecta*, which bloom from July to October. The earliest-flowering species is *Verbena bracteata*, with a flowering period extending from June to August.

Based on the obtained research results, a comprehensive assessment of the success of *Verbena* species introduction was conducted, which made it possible to classify them into two groups according to their potential for practical use (Table 4).

According to the evaluation of decorative qualities, *Verbena bonariensis* ranks first, achieving the highest score (12 out of 12). The second position is shared by *Verbena canadensis*, *Verbena elegans*, *Verbena tenera*, and *Verbena tenuisecta*, each receiving 10 points. In third place are *Verbena bracteata*, *Verbena hastata*, and *Verbena rigida*, with scores of nine points each. The lowest score (eight points) was recorded for *Verbena stricta*, *Verbena urticifolia*, and *Verbena laciniata*.

In terms of economic and biological characteristics, the *Verbena* species scored between 10 and 16 out of a possible 16 points, indicating a high level of adaptation to the edaphoclimatic conditions of the introduction site.

All species are capable of seed reproduction; however, seed ripening is uneven, and germination rates vary, which resulted in different scores for this indicator. Self-seeding was observed in *Verbena bonariensis*, *Verbena canadensis*, and *Verbena tenera*.

They also demonstrated good drought tolerance, except for *Verbena urticifolia*, while the highest cold tolerance (three points) was recorded in *Verbena canadensis* and *Verbena bonariensis*. The least cold-resistant species (one point) were *Verbena elegans*, *Verbena urticifolia*, and *Verbena laciniata*. All species also exhibited high resistance to pathogenic factors, with each receiving the maximum score of three points.

Based on the evaluation of biological qualities, *Verbena bonariensis* ranked first, receiving the maximum score of 16 points. *Verbena canadensis*, *Verbena elegans*, *Verbena tenera*, and *Verbena tenuisecta* all received 14 points each, while *Verbena rigida* scored 13 points. The lowest score, 10 points, was recorded for *Verbena urticifolia* and *Verbena laciniata*.

According to the evaluation scale, the studied species were classified into two groups based on their

Table 4. Comprehensive assessment of the success of the introduction and prospects for the use of species of the genus *Verbena* L. (in points).* Perspective of use in landscape design: HP – highly promising, P – promising

Species	Evaluation of ornamental qualities					Assessment of economic-biological qualities							Integral assessment	***Perspectives of use**
	Flower colour	Total number of flowers on the plant	Abundance of flowering	Habitus	Total points	Flowering duration	Seed propagation ability	Self-seeding ability	Drought	Cold tolerance	Resistance to pests and diseases	Total points		
Verbena bracteata	3	2	2	2	9	2	3	-	3	2	3	13	22	HP
Verbena canadensis	2	3	3	2	10	2	3	1	3	3	3	15	25	HP
Verbena hastata	3	1	2	3	9	2	2	-	3	2	3	12	21	P
Verbena elegans	3	3	2	2	10	2	2	-	3	1	3	11	21	P
Verbena stricta	3	1	1	3	8	1	2	-	3	2	3	11	19	P
Verbena urticifolia	2	2	2	2	8	1	3	-	2	1	3	10	18	P
Verbena bonariensis	3	3	3	3	12	3	3	1	3	3	3	16	28	HP
Verbena laciniata	2	2	2	2	8	1	2	-	3	1	3	10	18	P
Verbena rigida	3	2	2	2	9	1	3	-	3	3	3	13	22	HP
Verbena tenera	2	3	3	2	10	2	3	1	3	2	3	14	24	HP
Verbena tenuisecta	2	3	3	2	10	3	3	-	3	2	3	14	24	HP

potential for use: highly promising (22–28 points) and promising (17–21 points).

The highly promising species include *Verbena bracteata*, *Verbena bonariensis*, *Verbena canadensis*, *Verbena rigida*, *Verbena tenuisecta*, and *Verbena tenera*. *Verbena bonariensis* received the highest total score (28 points), followed by *Verbena canadensis*, *Verbena tenuisecta* and *Verbena tenera* (24 points each), and *Verbena rigida* (22 points).

Promising species include *Verbena hastata* and *Verbena elegans* (21 points each), *Verbena stricta* (19 points), and *Verbena laciniata* and *Verbena urticifolia* (18 points each).

Thus, based on a comprehensive assessment of introduction success, six species (*Verbena bracteata*, *Verbena canadensis*, *Verbena bonariensis*, *Verbena tenera*, *Verbena tenuisecta*, and *Verbena rigida*) were identified as highly promising, and five species (*Verbena hastata*, *Verbena elegans*, *Verbena stricta*, *Verbena laciniata*, *Verbena urticifolia*) were considered promising for use in landscape design.

DISCUSSION

A key aspect of species introduction into new environments is the study of changes in plant life processes under novel conditions (Moroz & Vasyuk, 2001). This study provides original comparative data on the biological traits of *Verbena* species from different geographical origins under identical introduction conditions in the Forest-Steppe of Ukraine. These results are reported here for the first time.

Both literature data and our own observations indicate that introduced Verbena species exhibit high plasticity, allowing them to adapt their life forms to local conditions. In their native ranges, most are perennial hemicryptophytes; *Verbena laciniata* is a chamaephyte, while *Verbena bracteata* and *Verbena tenera* are annual or biennial therophytes (Turner, 1999; Yatskievych, 2013). However, under introduction conditions in the Forest-Steppe of Ukraine, some species change their life form, and all introduced species behave as annual therophytes. This phenomenon is determined by the regional climate, which exceeds their natural winter hardiness.

Phenological observations confirm this adaptation: all species complete a full life cycle typical of annual plants. They flower in the first year and produce fully mature seeds. Species such as *Verbena bracteata*, *Verbena canadensis*, *Verbena hastata*, *Verbena elegans*, *Verbena laciniata*, and *Verbena stricta* complete vegetative growth before the critical temperatures that define the growing season for other introduced species. In contrast, *Verbena bonariensis* and *Verbena rigida*, which have more extended growth periods, can tolerate frosts down to -1…-2 °C while maintaining their ornamental qualities. Data on the phenology of *Verbena* species are almost entirely lacking in international databases and the literature, with only limited information available for *Verbena hastata* (Global Plant Phenological Data Portal, 2025).

Literature sources emphasise the high ecological plasticity of *Verbena canadensis*, *Verbena bonariensis*, and *Verbena rigida*. These species exhibit complex drought tolerance mechanisms, can grow on nutrient-poor soils, and are well-suited for low-maintenance, climate-resilient plantings (Wang et al., 2018; Yang et al., 2024). At the same time, these species have successfully naturalised outside their native ranges, which poses potential invasion risks through spontaneous spread or colonisation of natural ecosystems, threatening local biodiversity (Anton et al., 2017; Protopopova et al., 2020).

Therefore, before introducing new species into landscape plantings and starting mass propagation, it is important to assess their potential invasive risk. In our observations, *Verbena bonariensis*, *Verbena canadensis*, and *Verbena tenera* demonstrated self-seeding, while no escapes from cultivation were recorded. Further research is needed to evaluate the risk of spontaneous spread of *Verbena bonariensis*, *Verbena canadensis*, *Verbena rigida*, *and Verbena tenera* under Forest-Steppe conditions in Ukraine.

Other introduced *Verbena* species, V*erbena bracteata*, *Verbena hastata*, *Verbena elegans*, *Verbena stricta*, *Verbena tenuisecta*, *Verbena laciniata*, and *Verbena urticifolia*, are recommended for ornamental use in the Forest-Steppe of Ukraine.

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