

<https://doi.org/10.26565/1992-4224-2026-45-17>

UDC: 631.52:631.5

H. M. KORPITA¹, PhD (Agriculture),

Associate Professor of the Department of Genetics, Breeding and Plant Protection

e-mail: korpita@ukr.net ORCID ID: <https://orcid.org/0000-0002-0908-0129>

I. A. SHUVAR¹, DSc (Agriculture), Prof.,

Professor of the Department of Plant Growing Technologies

e-mail: shuvaria@ukr.net ORCID ID: <https://orcid.org/0000-0002-4149-1761>

¹*Stepan Gzhyskyi National University of Veterinary Medicine and Biotechnologies of Lviv*
1, Volodymyra Velykoho Str., Dubliany, Lviv Oblast, 80831, Ukraine

CONTROL OF *SOLIDAGO CANADENSIS* L. USING VARIOUS HERBICIDE PROTECTION SCHEMES

The aggressive spread of the invasive plant *Solidago canadensis* L. poses a serious threat to Ukraine's phytocenoses. This species rapidly colonizes areas due to the high viability of its root system and its wide ecological adaptability, making control by traditional methods difficult.

Purpose. The purpose of this study is to evaluate the effectiveness of three herbicide treatment schemes for controlling *Solidago canadensis* L., using herbicides based on dicamba, triasulfuron, and glyphosate.

Methods. The effectiveness of three chemical control schemes was studied from 2021 to 2025 in the Forest-Steppe zone of Ukraine. Herbicides based on triasulfuron, dicamba, and glyphosate were tested. Effectiveness was assessed by measuring the toxic effect on plants, reduction in biomass, number of viable shoots, and the weed's ability to regenerate. Observations covered the growing season and analyzed long-term effects of herbicide application.

Results. The highest effectiveness was shown by the herbicide Lintur 70 WG, containing triasulfuron and dicamba. It caused up to 94.3 percent plant death and minimal regeneration during the season. Herbicides based on glyphosate and dicamba alone were less effective, particularly in long-term control and root suppression. The use of Lintur 70 WG significantly reduced *Solidago canadensis* density and lowered the risk of repeated proliferation.

Conclusions. The results indicate that the combination of triasulfuron and dicamba is suitable for effective control of *Solidago canadensis* in agricultural lands. These findings can serve as a basis for practical recommendations for chemical protection of crops, aimed at maintaining productivity and ecological stability of phytocenoses.

KEYWORDS: dicamba, glyphosate, invasive weeds, phytotoxicity, triasulfuron

Як цитувати: Korpita H. M., Shuvar I. A. Control of *Solidago canadensis* L. using various herbicide protection schemes. *Людина та довкілля. Проблеми неоекології*. 2026. Вип. 45. С. 221–228. <https://doi.org/10.26565/1992-4224-2026-45-17>

In cites: Korpita, H. M., & Shuvar, I. A. (2026). Control of *Solidago canadensis* L. using various herbicide protection schemes. *Man and Environment. Issues of Neoecology*, (45), 221–228. <https://doi.org/10.26565/1992-4224-2026-45-17>

Introduction

Invasive weeds pose one of the most serious threats to phytocenoses, biodiversity of natural habitats, and the economic stability of agricultural production. The spread of alien plant species leads to profound structural and functional changes in plant communities, disrupts ecological balance, and reduces the productivity of agricultural landscapes. In many regions of the world, invasive plants are considered one of the key drivers of biodiversity loss and habitat degradation, as they compete with native species for resources such as light,

water, nutrients, and space. As a result, natural phytocenoses are transformed, the species composition of plant communities changes, and the benefits provided by natural vegetation may decline significantly [1-2].

One of the most aggressive alien species in Ukraine is *Solidago canadensis* L., a perennial herbaceous plant belonging to the Asteraceae family. This species originates from North America but has rapidly expanded across Europe and Asia during the last decades. *Solidago canadensis* is characterized by high ecological

plasticity, rapid vegetative propagation through rhizomes, and abundant seed production. These biological features enable the species to colonize a wide range of habitats, including agricultural lands, abandoned fields, forest edges, riverbanks, roadsides, and disturbed areas. The plant forms dense monodominant stands that suppress the growth and development of native vegetation, thereby significantly reducing species diversity within invaded communities [3-4].

The spread of *Solidago canadensis* causes significant ecological and economic consequences. In natural habitats, the species displaces native plants and alters the structure of plant communities, which ultimately leads to a decline in biodiversity. In agricultural landscapes, the invasion of this species contributes to a decrease in the productivity of forage lands, deterioration of pasture quality, and an increase in the costs associated with weed control [5]. Dense stands of *S. canadensis* can also negatively affect soil properties and nutrient cycling processes, leading to long-term degradation of invaded areas. In addition, the species demonstrates strong competitive ability that further inhibits the germination and growth of surrounding plants [6].

Control of *Solidago canadensis* is complicated by its high ecological plasticity and adaptability to various environmental conditions. The species demonstrates considerable tolerance to drought, soil nutrient fluctuations, and anthropogenic disturbances [7]. Moreover, the presence of a well-developed rhizome system allows plants to rapidly regenerate after mechanical removal or partial damage. These biological characteristics significantly reduce the effectiveness of traditional mechanical or agrotechnical control methods and necessitate the use of integrated management strategies aimed at limiting the spread of the species and suppressing its vegetative regeneration [8-9].

Among available control methods, chemical protection remains one of the most effective approaches to reducing the abundance of *Solidago canadensis*, especially in areas with high levels of infestation. Herbicides with systemic action are capable of penetrating plant tissues and translocating to the root system, which increases the likelihood of complete plant destruction and prevents subsequent regrowth. However, the efficiency of herbicide treatments largely depends on the active ingredients used, the growth stage of the weed, environmental conditions, and the application method. Therefore, the selection of

effective herbicides with a high level of systemic activity is of critical importance for successful control of invasive weeds in agricultural and semi-natural ecosystems [10].

In Ukraine, the problem of invasive plants is becoming particularly urgent due to significant anthropogenic transformation of landscapes and a high level of disturbance of natural habitats. Numerous alien species, including *Solidago canadensis*, *Heracleum sosnowskyi*, and *Ambrosia artemisiifolia*, are actively spreading in forest areas, roadsides, arable lands, and urban landscapes. Their proliferation leads to the displacement of native species, a decrease in biodiversity, disruption of soil cover, and alteration of key ecological processes [11-12]. This, in turn, affects the productivity of agricultural lands, increases the costs of plant protection and weed control, and poses a threat to natural landscapes and the conservation of rare flora. Thus, research on invasive species and the development of effective control methods are of great importance for maintaining ecological stability and economic sustainability of agroecosystems in Ukraine [13-14].

Invasive weeds not only threaten biodiversity and agricultural productivity but also disrupt ecological functions that provide essential services to humans. The invasion of alien plants, such as *Solidago canadensis*, can alter nutrient cycling, soil microbial communities, and hydrological regimes, which in turn affects resilience and stability of natural habitats. Changes in soil structure and chemistry caused by dense stands of invasive plants may reduce the suitability of areas for native species and hinder the restoration of natural plant communities. Consequently, the ecological impact of invasive species extends beyond the immediate displacement of native flora and encompasses long-term alterations in fundamental ecological processes [15-16].

Furthermore, the economic consequences of invasive plants are substantial and multifaceted. In phytocenoses, infestations by *Solidago canadensis* increase production costs due to additional labor, machinery use, and chemical inputs required for control. Infested pastures and meadows often show reduced forage quality and biomass yield, leading to lower livestock productivity. In semi-natural landscapes, tourism and recreational value may decline as invasive stands replace aesthetically and ecologically valuable native vegetation. Quantifying these

ecological and economic impacts is essential for prioritizing management interventions and allocating resources efficiently [17].

Finally, the rapid spread of *Solidago canadensis* highlights the need for region-specific management strategies that consider local environmental conditions and the biology of the species. Climatic factors, soil fertility, land use patterns, and disturbance regimes all influence the success of invasive plant control. Integrated approaches, combining mechanical, chemical, and preventive measures, are increasingly recommended, but their implementation requires detailed knowledge of weed growth dynamics, regeneration potential, and herbicide efficacy under local conditions. Therefore, research aimed at evaluating the comparative effectiveness of

different herbicidal treatments provides critical information for designing sustainable and evidence-based control programs [18].

The aim of this study is to assess the effectiveness of three herbicide protection schemes against *Solidago canadensis* L. using preparations based on dicamba, triasulfuron, and glyphosate. A comparative analysis of their influence on weed vegetative mass, the dynamics of biomass reduction, and the potential for plant recovery after treatment was conducted. The results obtained can serve as a scientific basis for developing practical recommendations for chemical weed control and improving management strategies aimed at limiting the spread of *Solidago canadensis* in the northern and central regions of Ukraine.

Materials and Methods

Studies to assess the effectiveness of chemical control of *Solidago canadensis* L. were conducted in 2021–2024 in the Forest-Steppe zone of Ukraine. The soils of the experimental plot are gray forest medium loam, with a humus content of 2.6%, pH of the salt extract is 6.1. The area of the accounting plot is 125 m², the number of

repetitions is three, the placement of variants is by the method of complete randomization (Fig. 1).

The areas of herbicide application include natural, semi-natural, and ruderal sites (abandoned plots), where the control of *Solidago canadensis* can be carried out with minimal risk to other plant species.

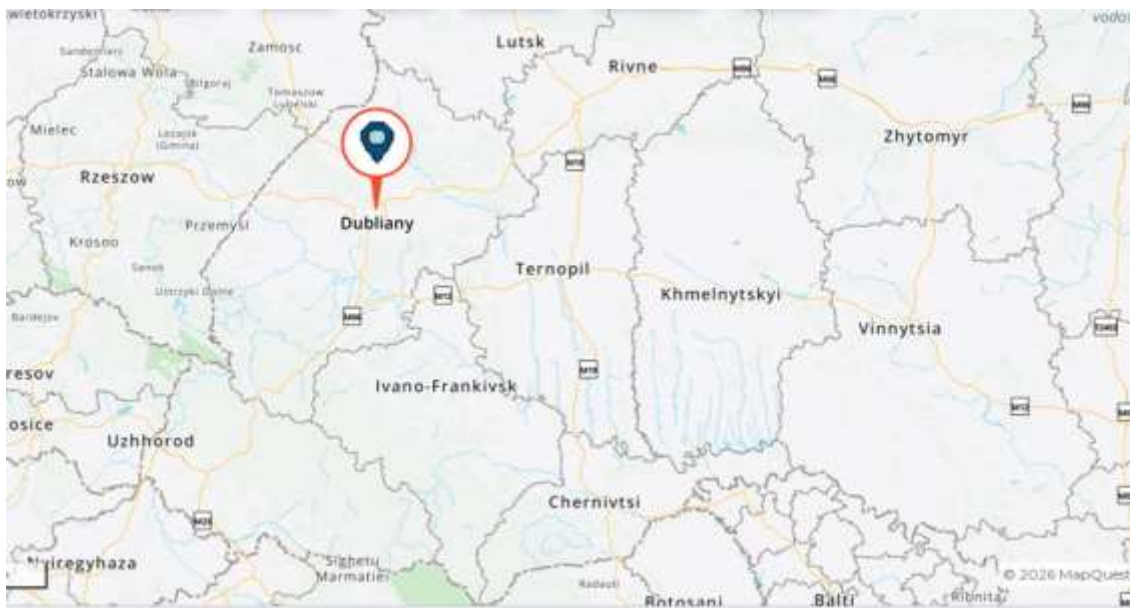


Fig. 1 – Location of the research area

Before treatment, weeds were counted by the number of plants per 1 m² and by phenophases of development. At the time of application of the preparations, *Solidago canadensis* plants were in the phase of active vegetative growth (30–50 cm in height). The study compared three herbicide protection schemes (Table 1).

The treatment was carried out using a manual knapsack sprayer at an air temperature of +20–+23°C, humidity of 65–70% and wind speed of no more than 2 m/s. The working solution consumption rate was 300 l/ha. The assessment of the effectiveness of herbicides was carried out visually using the EWRC

Table 1

**Herbicide protection schemes for the control
of *Solidago canadensis* L.**

Variant	Herbicide	Consumption rate, kg/ha or l/ha	Active ingredient(s)	Active ingredient content
I	Lintur 70 WG	0,3 kg/ha	Triasulfuron	41 g/kg
			Dicamba (sodium salt)	659 g/kg
II	Dianate BASF	1,5 l/ha	Dicamba	480 g/l
III	Roundup Max	4,0 l/ha	Glyphosate (potassium salt)	551 g/l (equiv. 450 g/l)

(European Weed Research Council) scale on the 7th, 14th, 28th and 42nd day after treatment. Additionally, the following were taken into account: a decrease in the number of viable shoots per 1 m²; the degree of suppression of aboveground biomass; the percentage of plant

death; signs of plant regeneration on the 60th day.

Statistical processing of the results was carried out by the method of variance analysis using the LSD_{0.05} significance criterion. Averaged data are presented with an indication of the standard deviation.

Results and Discussion

The results presented demonstrate differences in the effectiveness of the studied herbicides in suppressing *Solidago canadensis* L. over the observation period. Seven days after application, the highest level of plant suppression was recorded in the treatment with Lintur 70 WG, where the effectiveness reached 63.5%. During the same period, Roundup Max provided a suppression level of 52.1%, while Dianate BASF showed the lowest initial effect at 47.8%. This indicates a faster initial action of Lintur 70 WG compared with the other herbicides.

Fourteen days after treatment, the effectiveness of all herbicides increased considerably. The highest values were again observed in the variant with Lintur 70 WG (78.7%), confirming its high biological activity against the studied species. In the treatment with Roundup Max, plant suppression reached 73.4%, whereas Dianate BASF provided 69.6% effectiveness. Although the differences between the herbicides became slightly smaller at this stage, Lintur 70 WG still demonstrated the best performance.

On the 28th day after application, the effectiveness of the herbicides continued to increase. The highest suppression level was recorded for Lintur 70 WG (84.3%). Slightly lower values were observed for Roundup Max (82.6%), indicating high but somewhat slower activity of this herbicide. In contrast, Dianate BASF reached 74.1%, reflecting a more moderate level of effectiveness compared with the other treatments.

The maximum effectiveness values were recorded 42 days after herbicide application. In the treatment with Lintur 70 WG, plant suppression reached 91.8%, indicating the highest biological efficiency against *Solidago canadensis* L. Roundup Max ensured 84.7% suppression of plants, demonstrating stable and relatively high effectiveness throughout the entire observation period. The lowest values remained in the Dianate BASF treatment (79.3%), although this herbicide also provided a substantial reduction in the viability of the invasive species population (Table 2).

Table 2

**Effectiveness of herbicides against *Solidago canadensis* L.
in dynamics, %**

Variant	Herbicide	7 days	14 days	28 days	42 days
I	Lintur 70 WG	63,5 ± 2,3	78,7 ± 3,1	84,3 ± 2,8	91,8 ± 3,5
II	Dianate BASF	47,8 ± 2,3	69,6 ± 3,1	74,1 ± 2,8	79,3 ± 3,5
III	Roundup Max	52,1 ± 2,3	73,4 ± 3,1	82,6 ± 2,8	84,7 ± 3,5

Overall, the results indicate that all studied herbicides are capable of effectively suppressing *Solidago canadensis* L., but their action differs in

both the speed and level of biological effectiveness. Lintur 70 WG proved to be the most effective herbicide, providing the highest level of

plant suppression throughout the study period. Roundup Max showed high but slightly slower activity, while Dianate BASF demonstrated comparatively lower effectiveness.

Analysis of the data presented in Figure 1 shows a significant difference in the effectiveness of the studied herbicides in controlling *Solidago canadensis* 60 days after treatment. The highest results are demonstrated by Lintur 70 WG: the reduction in the number of shoots is 88%, the suppression of aboveground biomass is 91.2%, and the death of plants reaches 89.6%. The data confirm the high activity of the drug both in the destruction of the aboveground part of the weed and in the reduction of the regeneration ability - only 2-3 new plants per square meter.

Roundup Max showed average effectiveness. The reduction in the number of shoots was 71%, the biomass was suppressed by 77.4%, and the death of plants was at the level of 73.1%. Despite a fairly good level of action,

noticeable signs of regeneration were observed - up to 5-7 new plants/m², which indicates a less deep effect on the root system compared to Lintur. The lowest efficiency was found by BASF's Dianat: shoot suppression was 63%, biomass - 68.5%, plant death - 64.7%, and regeneration ability remained the highest among all variants - up to 8-11 new plants per 1 m². This indicates an insufficient long-term effect of the drug on perennial weeds with a developed root system. Thus, among the studied herbicides, the most effective means of controlling *Solidago canadensis* L. was Lintur 70 WG, which provided comprehensive suppression of vegetative mass, a high level of weed death and minimal signs of regeneration on the active ingredients, their concentration and mechanism of action. (Fig. 1).

The results of the study confirm the significant difference in the effectiveness of herbicides in controlling (*Solidago canadensis* L.) depending on the active ingredients, their concentration and mechanism of action. The highest efficiency was demonstrated by the

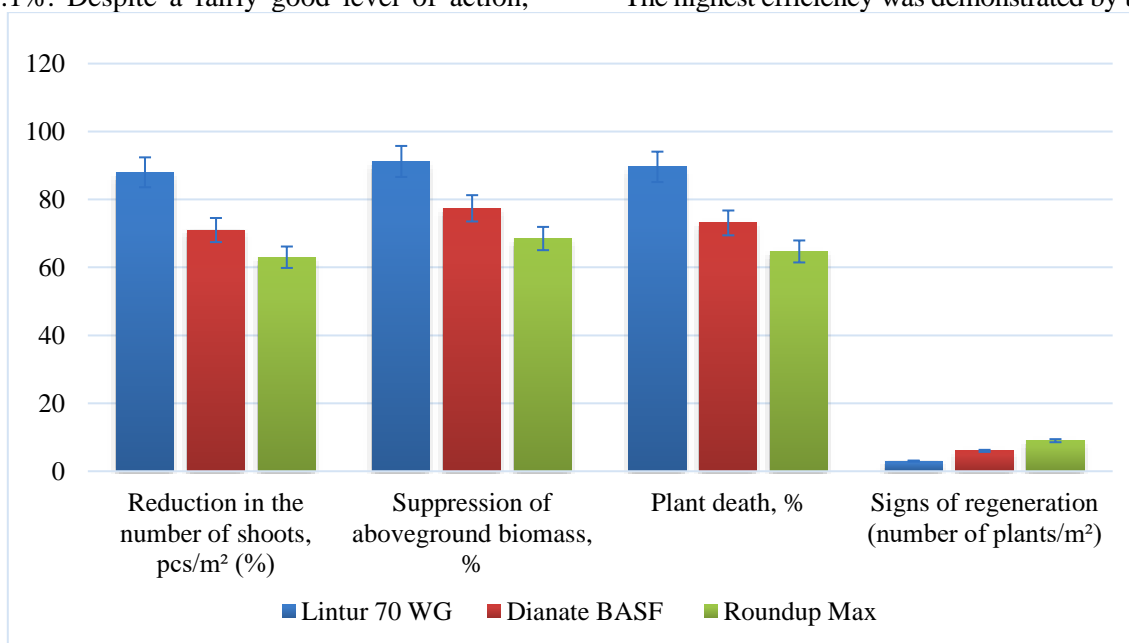


Fig. 1 – Comparison of herbicide effects on biomass, death, and recovery of *Solidago canadensis* L.

herbicide Lintur 70 WG, which includes triasulfuron (ALS inhibitor) and dicamba (synthetic auxin). The combination of two active ingredients with different mechanisms of action resulted in a powerful and long-lasting phytotoxic effect on the weed, including the root system, which ensured stable control of *S. canadensis*, which was manifested in a high percentage of plant death, a significant decrease in biomass and a slight regeneration ability even 60 days after treatment. Roundup Max, which contains glyphosate, was somewhat less effective. Although the initial

phytotoxic effect was noticeable, over time, partial recovery of plants was observed, which is explained by the lower ability of the drug to completely penetrate the perennial root system of *Solidago canadensis*. This result is consistent with well-known data on the decrease in the effectiveness of glyphosate in the fight against aggressive transient and perennial weeds. Dianat BASF with a single active ingredient, dicamba, showed the lowest effectiveness. Although dicamba has the ability to suppress a wide range of dicotyledonous weeds, in the case of *Solidago canadensis* its

effect was insufficient for long-term control. This indicates the need to combine dicamba with other active ingredients to achieve a deeper effect on the root system and reduce the regeneration capacity.

All three herbicides showed phytotoxic effect in the early stages after treatment, however, only in the conditions of variant I it was possible to provide stable control and minimize regrowth of the weed. Accordingly, for effective chemical protection of natural and semi-natural lands infested with *Solidago canadensis*, it is advisable to use preparations with multicomponent composition and different mechanisms of action.

Comparison of the obtained results with recent studies confirms the general patterns of herbicidal control effectiveness against *Solidago canadensis* L., while highlighting the significant role of the mode of action of the herbicides and their influence on interspecific competition and plant regeneration.

In the study [19], it was shown that *Solidago canadensis* exhibits higher tolerance to glyphosate compared to native species, and increasing the herbicide dose may even enhance its competitive advantage. Our results partially agree with these findings: although Roundup Max demonstrated relatively high effectiveness (84.7%), considerable plant regeneration was observed. This indicates that glyphosate does not provide complete control of *S. canadensis* and may leave viable underground organs.

Similar results were reported by T. Rajdus [20], who demonstrated that glyphosate application alters interspecific competition and

does not always reduce the invasive potential of *Solidago canadensis*, and in some cases may even promote its dominance. This explains the insufficient long-term effectiveness of glyphosate and the observed regrowth after its application in our study.

In the study [21] was shown that even with glyphosate use, a significant reduction in biomass and physiological activity of *S. canadensis* does not guarantee complete plant eradication, and effectiveness is considerably increased only when combined with other agents. In particular, a decrease in root biomass by 26–81% was reported. This is consistent with our results, where the highest effectiveness was achieved using the combined herbicide Lintur 70 WG, which affected both the aboveground and underground parts of the plant.

The findings of Chun-Feng [22] also confirm that controlling *Solidago canadensis* under natural conditions is challenging and requires a systematic approach, as a single herbicide application does not provide stable long-term control. This aligns with our results for Dianate BASF, which showed the lowest effectiveness and the highest level of plant regeneration.

The obtained results clearly demonstrate the advantage of combined herbicides. The high effectiveness of Lintur 70 WG confirms the need for a comprehensive impact on the physiological processes of plants. This ensures not only rapid suppression of *Solidago canadensis* but also a significant reduction in its regenerative capacity over the long term.

Conclusion

The study confirmed that the effectiveness of chemical control of invasive perennial plants, such as *Solidago canadensis* L., is largely determined by the composition of active substances and the mechanisms of action of the drugs. The most stable and long-lasting effect is achieved by the use of herbicides with a combined composition, which affect not only the above-ground part of the plant, but also its root system. The biological characteristics of the species, in particular the ability to vegetative

reproduction and rapid regeneration after damage, significantly affect the effectiveness of control methods, which emphasizes the need for an integrated approach. Chemical protection should be considered as part of a comprehensive strategy for managing invasive weeds, combined with agrotechnical and mechanical measures, which allows minimizing the risk of regeneration and contributes to the long-term restoration of local plant communities after the invasion of an aggressive species.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the authors have fully complied with ethical standards, including plagiarism, data falsification, and duplicate publication.

Authors Contribution: all authors have contributed equally to this work.

AI Statement

In this study, generative artificial intelligence was not used

References

1. Bang, A., Cuthbert, R. N., Haubrock, P. J., Fernandez, R. D., Moodley, D., Diagne, C., Turbelin, A. J., Renault, D., Dalu, T., & Courchamp, F. (2022). Massive economic costs of biological invasions despite widespread knowledge gaps: A dual setback for India. *Biological Invasions*, 24, 2017–2039. <https://doi.org/10.1007/s10530-022-02780-z>
2. Dakhil, M. A., El-Keblawy, A., El-Sheikh, M. A., Halmy, M. W. A., Ksiksi, T., & Hassan, W. A. (2021). Global invasion risk assessment of *Prosopis juliflora* at biome level: Does soil matter? *Biology*, 10, 203. <https://doi.org/10.3390/biology10030203>
3. García-Mozo, H. (2024). Assessment of the diversity, abundance and range of invasive alien plant species in Córdoba, a Mediterranean urban area. *Diversity*, 16, 777. <https://doi.org/10.3390/d16120777>
4. Khan, A. M., Li, Q., Saqib, Z., Khan, N., Habib, T., Khalid, N., Majeed, M., & Tariq, A. (2022). MaxEnt modelling and impact of climate change on habitat suitability variations of economically important chilgoza pine (*Pinus gerardiana* Wall.) in South Asia. *Forests*, 13, 715. <https://doi.org/10.3390/f13050715>
5. Lipińska, N., Lipiński, W., Shuvar, I., Korpita, H., & Shuvar, A. (2023). Invasive species of plants and their threat to biodiversity. *Plant and Soil Science*, 14(1), 51–66. <https://doi.org/10.31548/plant1.2023.51>
6. Szabó, A.-K., Bálint, J., Molnár, A., Aszalos, S. E., Fora, C. G., Loxdale, H. D., & Balog, A. (2022). Associational susceptibility of crop plants caused by the invasive weed Canadian goldenrod, *Solidago canadensis*, via local aphid species. *Frontiers in Ecology and Evolution*, 10, 1080599. <https://doi.org/10.3389/fevo.2022.1080599>
7. Nagabhushan Arun, M., Mahender Kumar, R., Sreedevi, B., Padmavathi, G., Revathi, P., Pathak, N., & Venkatanna, B. (2023). The rising threat of invasive alien plant species in agriculture. *IntechOpen*. <https://doi.org/10.5772/intechopen.106742>
8. Rai, P. K., & Singh, J. S. (2020). Invasive alien plant species: Their impact on environment, ecosystem services and human health. *Ecological Indicators*, 111, 106020. <https://doi.org/10.1016/j.ecolind.2019.106020>
9. Rashid, I., Haq, S. M., Lembrechts, J. J., Khuroo, A. A., Pauchard, A., & Dukes, J. S. (2021). Railways redistribute plant species in mountain landscapes. *Journal of Applied Ecology*, 58, 1967–1980. <https://doi.org/10.1111/1365-2664.13961>
10. Szabó, A.-K., Bálint, J., Molnár, A., Aszalos, S.E., Fora, C.G., Loxdale, H.D. and Balog, A. (2022) Associational susceptibility of crop plants caused by the invasive weed Canadian goldenrod, *Solidago canadensis*, via local aphid species. *Front. Ecol. Evol.* 10, 1080599. <https://doi.org/10.3389/fevo.2022.1080599>
11. Shuvar, I., Korpita, H., Balkovskiy, V., Shuvar, A., & Kropyvnytskyi, R. (2021). *Asclepias syriaca* L. is a threat to biodiversity and agriculture of Ukraine. *BIO Web of Conferences*, 36, 07010 <https://doi.org/10.1051/bioconf/20213607010>
12. Shuvar, I., Korpita, H., Shuvar, A., Shuvar, B., & Kropyvnytskyi, R. (2021). Invasive plant species and the consequences of its prevalence in biodiversity. *BIO Web of Conferences*, 31, 00024. <https://doi.org/10.1051/bioconf/20213100024>
13. Semchuk, N. N., & Balun, O. V. (2020). Development of a biological method to control the poisonous weed plant *Heracleum sosnowskyi* Manden. *IOP Conference Series: Earth and Environmental Science*, 613, 012132. <https://doi.org/10.1088/1755-1315/613/1/012132>
14. Havryliuk, O.; Hovorukha, V.; Bida, I.; Gladka, G.; Tymoshenko, A.; Kyrylov, S.; Mariychuk, R.; Tashyrev, O. (2023). Anaerobic Degradation of the Invasive Weed *Solidago canadensis* L. (goldenrod) and Copper Immobilization by a Community of Sulfate-Reducing and Methane-Producing Bacteria. *Plants* 12, 198. <https://doi.org/10.3390/plants12010198>
15. Słowiński, K., Grygierzec, B., Synowiec, A., Tabor, S., & Araniti, F. (2022). Preliminary study of control and biochemical characteristics of giant hogweed (*Heracleum sosnowskyi* Manden.) treated with microwaves. *Agronomy*, 12, 1335. <https://doi.org/10.3390/agronomy12061335>
16. Sužiedelytė Visockienė, J., Tumelienė, E., & Maliene, V. (2020). Identification of *Heracleum sosnowskyi*-invaded land using earth remote sensing data. *Sustainability*, 12(3), 759 <https://doi.org/10.3390/su12030759>
17. Tiwari, S., Mishra, S. N., Kumar, D., Kumar, B., Vaidya, S. N., Ghosh, B. G., Rahaman, S. M., Khatun, M., Garai, S., & Kumar, A. (2022). Modelling the potential risk zone of *Lantana camara* invasion and response to climate change in eastern India. *Ecological Processes*, 11. <https://doi.org/10.1186/s13717-021-00354-w>
18. Rajdus, T., & Švehláková, H., & Plohák, P., & Stalmachova, B. (2020). Management of invasive species *Solidago canadensis* in Ostrava region (Czech Republic). *IOP Conference Series: Earth and Environmental Science*, 444, 012046. <https://doi.org/10.1088/1755-1315/444/1/012046>
19. Ye, X., Gu, C., Meng, J., Wu, M. (2025). Differences in the Response of Invasive *Solidago canadensis* and Native *Imperata cylindrica* to Glyphosate. *Plants*, 14, 2640. <https://doi.org/10.3390/plants14172640>
20. Rajdus, T. & Švehláková, H. & Plohák, P. & Stalmachova, B. (2020). Management of invasive species *Solidago canadensis* in Ostrava region (Czech Republic). *IOP Conference Series: Earth and Environmental Science*. 444. 012046. <https://doi.org/10.1088/1755-1315/444/1/012046>

21. Anas, M., Huang, Z.Y., Xiong, H., Imran, M., Yan, M.T., Javed, Q., Ren, G.Q., Qi, S.S., Li, J., Dai, Z.C., Du, D.L. (2025). Response of invasive *Solidago canadensis* to foliar application of natural herbicide and glyphosate. *J Environ Manage*. Nov;394:127522. <https://doi.org/10.1016/j.jenvman.2025.127522>
22. Chun-Feng, G.U., Xiao-Qi, Y.E., Ming, W.U., Xue-Xin, SH., Sheng-Wu, J. (2017). Effects of glyphosate on interspecific competition between *Solidago canadensis* and *Imperata cylindrica*[J]. *Chin J Plan Ecolo*, 2017, 41(4): 439-449.. <https://doi.org/10.17521/cjpe.2016.0331>

Submission received: 22.03.2026 / Revised: 24.04.2026 / Accepted: 30.04.2026 / Published: 30.05.2026

Г. М. КОРПИТА¹, канд. с/х наук,
дцент кафедри генетики, селекції та захисту рослин
e-mail: korpita@ukr.net ORCID ID: <https://orcid.org/0000-0002-0908-0129>

І. А. ШУВАР¹, д-р с/х наук, проф.,
професор кафедри технологій у рослинництві
e-mail: shuvaria@ukr.net ORCID ID: <https://orcid.org/0000-0002-4149-1761>
¹Львівський національний університет ветеринарної медицини та біотехнологій
імені С.З. Гжицького

вул. В. Великого, 1, м. Дубляни, Львівська область, 80381, Україна

КОНТРОЛЬ *SOLIDAGO CANADENSIS* L. ІЗ ЗАСТОСУВАННЯМ РІЗНИХ СХЕМ ГЕРБИЦІДНОГО ЗАХИСТУ

Агресивне поширення інвазійної рослини *Solidago canadensis* L. становить серйозну загрозу фітоценозам України. Цей вид швидко колонізує території завдяки високій життєздатності кореневої системи та широкій екологічній адаптивності, що ускладнює боротьбу традиційними методами.

Мета. Оцінка ефективності трьох схем гербицидної обробки для боротьби з *Solidago canadensis* L. з використанням гербицидів на основі дикамби, триасульфурону та гліфосату.

Методи. Ефективність трьох схем хімічної боротьби вивчалася з 2021 по 2025 рік у Лісостеповій зоні України. Випробувані гербициди на основі триасульфурону, дикамби та гліфосату. Ефективність оцінено шляхом вимірювання токсичного впливу на рослини, зменшення біомаси, кількості життєздатних пагонів та здатності бур'яну до регенерації.

Результати. Найвищу ефективність показав гербицид Лінтур 70 WG, що містить триасульфурон та дикамбу. Це спричинило до 94,3% загибелі рослин та мінімальну регенерацію протягом сезону. Гербициди на основі гліфосату та дикамби окремо були менш ефективними, особливо в довгостроковому контролі та пригніченні коренів. Використання Lintur 70 WG значно зменшило щільність *Solidago canadensis* та знизило ризик повторного розмноження.

Висновки. Результати показують, що комбінація триасульфурону та дикамби підходить для ефективного контролю *Solidago canadensis* на сільськогосподарських угіддях. Дані висновки можуть слугувати основою для практичних рекомендацій щодо хімічного захисту сільськогосподарських культур, спрямованих на підтримку продуктивності та екологічної стабільності агроecosystem.

КЛЮЧОВІ СЛОВА: дикамба, гліфосат, інвазійний бур'ян, фітотоксичність, триасульфурон

Конфлікт інтересів

Автори заявляють, що конфлікту інтересів щодо публікації цього рукопису немає. Крім того, автори повністю дотримувались етичних норм, включаючи плагіат, фальсифікацію даних та подвійну публікацію.

Внесок авторів: всі автори зробили рівний внесок у цю роботу.

Декларація про використання ШІ

У цьому дослідженні не використовувався генеративний штучний інтелект.

Отримано: 22.03.2026 / Переглянуто: 24.04.2026 / Прийнято: 30.04.2026 / Опубліковано: 30.05.2026