Doi: 10.46793/MAK2026.421M

INVASIVE WEEDS AT THE INTERFACE OF PLANT, ANIMAL AND HUMAN HEALTH: A ONE HEALTH PERSPECTIVE

Maja Meseldžija*, Milica Vranešević

Faculty of Agriculture, University of Novi Sad, Serbia,
***Corresponding author: maja.meseldzija@polj.edu.rs**

Abstract: Invasive weeds are increasingly being recognized as drivers of ecosystem degradation with long-term and cascading effects on animal and human health. Using a One Health perspective, this review synthesizes current knowledge about invasive weed species relevant to Serbia and Europe, highlighting their roles as sources of allergens and toxins, modifiers of ecosystems, and indirect health risk factors. Within the framework of the Common Agricultural Policy Strategic Plans, the importance of integrated and interdisciplinary management approaches is highlighted.

Keywords: Invasive alien plant species, Invasive weeds, One health, Ecosystem health, Common agricultural policy (CAP)

INTRODUCTION

Invasive alien plant species (IAPS) are increasingly recognized as one of the major drivers of biodiversity loss, ecosystem degradation, and functional disruption of natural and anthropogenic landscapes worldwide (Pyšek et al., 2020; Vilà et al., 2011). Their spread has been accelerated by globalization, intensified trade, land-use change, and climate change, allowing numerous non-native plant species to establish, spread, and exert ecological dominance far beyond their native ranges (Early et al., 2016). In agricultural and semi-natural ecosystems, invasive weeds represent a particular challenge due to their high adaptability, competitive ability, and capacity to interfere with crop production, ecosystem services, and environmental stability (Chen and Chen, 2019). While the ecological and economic impacts of invasive weeds have been widely documented, their implications for animal and human health remain comparatively underexplored and fragmented across disciplines (Schindler et al., 2015).

The One Health concept, which emphasizes the interconnectedness of ecosystem, plant, animal, and human health, and biodiversity, provides a comprehensive framework for addressing such complex and multi-dimensional challenges (Destoumieux-Garzón et al., 2018). Originally developed to improve coordination between human and veterinary medicine, One Health has evolved into a broader integrative approach that explicitly incorporates environmental and ecosystem health as foundational determinants of overall well-being (three of the most influential concepts at the moment, One Health, EcoHealth, and Planetary Health) (Lerner and Berg, 2017). Within this framework, invasive weeds can be viewed not merely as agricultural pests or ecological disruptors, but as active agents

influencing exposure pathways to allergens, toxins, bioactive compounds, and disease vectors, thereby affecting multiple components of the One Health triad simultaneously (Hulme, 2014).

Invasive weed species influence ecosystem health by altering plant community composition, reducing native biodiversity, modifying nutrient cycling, and disrupting ecosystem services such as pollination, soil stabilization, and water regulation (Vilà et al., 2011; Pyšek et al., 2012). Many invasive plants exhibit allelopathic effects, rapid growth, and high reproductive capacity, enabling them to outcompete native flora and create homogenized landscapes (Callaway and Ridenour, 2004). These ecological changes may cascade through trophic networks, affecting herbivores, pollinators, and microbial communities, with long-term consequences for ecosystem resilience and functionality (Schirmel et al., 2016). From a One Health perspective, such ecosystem-level alterations are critical, as degraded ecosystems are less capable of buffering environmental stressors and regulating biological risks (Destoumieux-Garzón et al., 2018).

The animal health dimensions of invasive weeds are particularly relevant in agricultural and pastoral systems. Numerous invasive plant species produce toxic secondary metabolites, including alkaloids, glycosides, phenolics, and latex compounds, which can pose direct risks to livestock and wildlife through ingestion or contact (Keeler et al., 2013; Stegelmeier et al., 2016). Contamination of forage and feed with invasive weed material may result in acute or chronic intoxication, reduced productivity, reproductive disorders, or mortality in domestic animals (Botha and Penrith, 2008). Additionally, invasive plants can modify habitats in ways that favor certain pest species or vectors, indirectly influencing the epidemiology of animal diseases (Hulme, 2014). Despite these risks, the veterinary and ecological implications of invasive weeds are often addressed separately, limiting the effectiveness of integrated risk assessment and management.

The human health impacts of invasive weeds are equally multifaceted and extend beyond direct toxicity. Certain invasive species are well-known sources of potent allergens, contributing to respiratory diseases, allergic rhinitis, and asthma, particularly in urban and peri-urban environments (Lake et al., 2016; Weger et al., 2016). Others produce bioactive compounds capable of causing dermatitis, poisoning, or adverse pharmacological effects following accidental exposure (Stegelmeier et al., 2016). Moreover, by reshaping ecosystems and agricultural practices, invasive weeds can indirectly influence food safety, air quality, and exposure to zoonotic pathogens (Hulme, 2014). These health effects are frequently underestimated in weed management strategies, which traditionally prioritize crop yield losses over broader societal and public health considerations (Bàrberi, 2019).

In Europe, and particularly in Southeast Europe, the spread of invasive weeds has been facilitated by agricultural intensification, land abandonment, infrastructure development, and climate variability (Essl et al., 2015). Serbia, located at the intersection of major biogeographical regions and characterized by diverse agroecosystems and urban–rural gradients, has experienced a notable increase in the presence and impact of invasive alien plant species (Vrbničanin et al., 2015). Species such as *Ambrosia artemisiifolia*, *Ailanthus altissima*, *Asclepias syriaca*, *Datura* spp., and others have become established across agricultural fields, ruderal habitats, forests, and urban areas, posing ecological, agronomic, and health-related challenges (IASV, 2011; Meseldžija et al., 2019; EPPO, 2026; DAISIE,

2026). While individual studies have addressed the biology, distribution, or management of selected invasive species in Serbia, a comprehensive synthesis of their implications within a One Health framework is still lacking.

Given these knowledge gaps, there is a clear need for an integrative review that brings together ecological, agricultural, veterinary, and public health perspectives on invasive weeds. Such a synthesis is particularly relevant for regions like Serbia, where invasive species pressures intersect with transitional agricultural systems, urban expansion, and evolving policy frameworks. By applying a One Health lens, invasive weeds can be repositioned from isolated management problems to indicators of systemic vulnerabilities at the interface of ecosystems, animals, and humans.

One Health Concept and the Role of Invasive Weeds

In recent years, One Health has gained increasing relevance in the context of global environmental change**,** biodiversity loss, and intensified agricultural systems. Degraded ecosystems are more susceptible to biological invasions, pathogen emergence, and altered exposure pathways to environmental hazards (Hoberg and Brooks, 2015). Consequently, environmental disturbances such as land-use change, habitat fragmentation, and invasive species spread are now recognized as critical determinants of health risks across all components of the One Health triad (Destoumieux-Garzón et al., 2018). Within this framework, invasive alien plant species, particularly invasive weeds, represent a compelling yet underappreciated One Health issue. Traditionally addressed primarily through agronomic or ecological lenses, invasive weeds also have profound implications for animal and human health, acting as biological, chemical, and ecological stressors within agroecosystems and urban environments (Schindler et al., 2015). Invasive weed species are capable of producing a wide range of secondary metabolites that serve ecological functions such as herbivore deterrence and competitive dominance but may pose significant health risks to animals and humans. (Keeler et al., 2013; Stegelmeier et al., 2016). From a human health perspective, invasive weeds are important sources of airborne allergens**,** particularly pollen, which can exacerbate allergic rhinitis, asthma, and other respiratory conditions. Species with prolonged flowering periods, high pollen production, and strong dispersal capacity contribute disproportionately to allergen exposure, especially in urban and peri-urban settings (Lake et al., 2016). Climate change further amplifies these effects by extending growing seasons and increasing pollen loads, thereby intensifying public health burdens associated with invasive allergenic plants (Bielory et al., 2012).

In addition to allergens and toxins, invasive weeds may function as reservoirs or facilitators of pathogens and pests. By altering habitat structure and microclimatic conditions, invasive plants can support populations of insects, rodents, and microorganisms that act as vectors or hosts of infectious agents (Hulme, 2014). Despite these documented risks, invasive weeds are rarely incorporated into formal health risk assessments, which tend to focus on pathogens, chemical pollutants, or zoonotic agents. The One Health framework underscores the need to broaden this perspective and recognize invasive plants as contributing factors to cumulative health risks at the human-animal-environment interface (Destoumieux-Garzón et al., 2018).

Beyond their direct health implications, invasive weeds exert profound effects on biodiversity and ecosystem stability**,** which in turn influence long-term health outcomes. Invasive plants frequently outcompete native species, reduce habitat heterogeneity, and simplify plant community structure, leading to declines in native flora and associated fauna (Vilà et al., 2011; Pyšek et al., 2012). These changes can disrupt trophic interactions, pollination networks, and soil microbial communities, undermining ecosystem resilience.

Allelopathic interactions represent an additional mechanism through which invasive weeds influence native plant communities and crop species, with cascading effects on ecosystem and One Health outcomes. Many invasive species release secondary metabolites that inhibit germination, growth, and establishment of neighboring plants, promoting their own dominance while suppressing native flora and economically important crops (Callaway and Ridenour, 2004; Pyšek et al., 2012; Vilà et al., 2011). Species such as *Ailanthus altissima* (Mill.) Swingle and *Reynoutria japonica* Hoult. are particularly effective in altering plant community composition through allelopathy, reducing habitat heterogeneity and forage availability. These effects indirectly impact animal and human health by limiting nutritious resources for livestock and wildlife, increasing exposure to toxic or allergenic plant species, and potentially prompting higher herbicide use or altered agricultural practices that affect environmental quality (Keeler et al., 2013; Stegelmeier et al., 2016; Bàrberi, 2019).

Although the One Health concept provides a robust theoretical framework, its application to invasive weed management remains limited, particularly at regional and national scales. In many countries, including Serbia, invasive weeds are primarily addressed through agronomic control measures, with insufficient consideration of their broader ecological and health-related implications. This disconnect highlights the need for region-specific syntheses that integrate ecological evidence, health risks, and policy contexts.

Invasive Weeds in Serbia: A One Health-Oriented Overview

The presence and spread of invasive alien plant species (IAPS) in Serbia represent a growing ecological, agricultural, and public health concern. Systematic efforts to identify and classify invasive plant species in the country began at the regional level, with the development of the list of invasive alien species for the Autonomous Province of Vojvodina (IASV, 2011), followed by the publication of the preliminary national list of invasive plant species in the Republic of Serbia by Lazarević et al. (2012). This national list, conceived as a foundational document to support future legislative acts, linked species identification with general control and management measures and marked a significant step toward coordinated invasive species governance (Table 1).

A comprehensive national monograph on invasive weeds in Serbia, covering invasion processes, ecological and genetic potential, pathways of introduction, spread, risk assessment, impacts, and mapping, was published by the Herbological Society of Serbia, offering strategic guidance for invasive plant management and directions for future research (Vrbničanin, ed., 2015).

Subsequent revisions and comparative analyses further refined the understanding of invasive plant diversity in Serbia. Notably, Stojanović and Jovanović (2018) conducted a comprehensive revision of the preliminary national list, incorporating a regional

perspective by comparing invasive plant species recorded in Serbia with those documented in eight neighboring countries (Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, North Macedonia, Bulgaria, Romania, and Hungary). Using *The Plant List: A Working List of All Known Plant Species* as a taxonomic reference, the authors identified a total of 165 invasive alien plant species across Serbia and the surrounding region. Their analysis highlighted substantial variability in the criteria used to designate invasiveness among countries, underscoring the context-dependent nature of biological invasions and the challenges of harmonizing regional management strategies (Stojanović and Jovanović, 2018).

In Serbia, invasive weeds are predominantly associated with agricultural land, ruderal habitats, river corridors, transportation infrastructure, and urban and peri-urban environments**,** reflecting the major pathways of introduction and spread. These pathways include contaminated crop seed material, agricultural machinery, trade and transport, horticultural activities, and intentional introductions followed by escape into natural or semi-natural ecosystems. Such habitats are characterized by frequent disturbance and high levels of human and animal activity, increasing the likelihood of exposure and amplifying the relevance of invasive weeds within a One Health context.

From an ecosystem perspective, invasive weeds in Serbia contribute to biodiversity loss, habitat homogenization, and reduced ecosystem stability**,** often through rapid growth, allelopathic interactions, and high reproductive capacity. Species such as *Ailanthus altissima* (Mill.) Swingle and *Reynoutria japonica* Hoult. are known for their strong competitive abilities and capacity to dominate disturbed and semi-natural habitats, leading to displacement of native vegetation and long-term alteration of ecosystem processes. These ecological impacts indirectly affect animal and human health by weakening ecosystem services that regulate environmental risks and support resilient landscapes.

In terms of animal and human health, several invasive weed species present in Serbia produce toxic or bioactive secondary metabolites, allergenic pollen, or other compounds of concern. *Asclepias syriaca* L. produces toxic latex containing cardiac glycosides, posing risks to livestock and potentially wildlife, while *Ailanthus altissima* (Mill.) Swingle has been associated with allergenic reactions and contact dermatitis in humans. *Helianthus annuus L.*, although widely cultivated, can exhibit invasive behavior in certain agroecosystems, acting as a volunteer weed that alters crop rotations and facilitates pest and pathogen persistence (Stojićević, 2020).

Table 1. Selected invasive or potentially invasive weed species in Serbia with relevance to One Health

Species	Typical habitats	Key One Health relevance
Ailanthus altissima	Urban, peri-urban, forests	Allergenicity, contact dermatitis, strong allelopathy, biodiversity loss
Asclepias syriaca	Agricultural land, grasslands	Livestock risk (toxic), ecosystem alteration
Ambrosia artemisiifolia	Crop lands, urban areas	Highly allergenic pollen, respiratory diseases
Reynoutria japonica	Riparian zones, disturbed sites	Habitat domination, ecosystem instability
Helianthus annuus	Agricultural fields	Agroecosystem disruption, pest and pathogen persistence

Invasive Weeds as Biological Stressors in One Health Systems

Within the One Health framework, invasive plants are increasingly recognized not only as drivers of biodiversity loss and agricultural disruption, but also as contributors to cumulative health risks through allergen production, toxic exposure, and ecosystem-mediated disease dynamics (Destoumieux-Garzón et al., 2018). In this sense, invasive weeds function as biological stress multipliers**,** intensifying existing vulnerabilities linked to land-use change, climate variability, and socio-economic factors (Romanelli et al., 2015).

One of the most well-documented mechanisms linking invasive weeds to human health is the production and dispersal of allergenic pollen and bioactive secondary metabolites**.** *Ambrosia artemisiifolia* L. represents a paradigmatic example, producing highly allergenic pollen that is strongly associated with allergic rhinitis and asthma, even at low airborne concentrations (Weger et al., 2016). The spread of this species across agricultural and urban landscapes has led to prolonged pollen seasons and increased sensitization rates in exposed populations, particularly in Central and Southeast Europe (Šikoparija et al., 2006; Smith et al, 2013).

Species such as *Datura* spp. produce tropane alkaloids (atropine and scopolamine), which can cause severe poisoning following accidental ingestion by livestock or contamination of food and feed (Konstantinović and Meseldžija, 2007). *Asclepias syriaca* contains cardiac glycosides in its latex and tissues, posing a documented risk to grazing animals and potentially to wildlife species unfamiliar with its chemical defenses (DiTomaso et al., 2017).

Beyond direct allergenic and toxic effects, invasive weeds act as drivers of indirect health risks by modifying habitat structure and ecological interactions. Dense monospecific stands of invasive plants, such as *Reynoutria japonica*, alter light availability, soil properties, and microclimatic conditions, leading to reduced native plant diversity and simplified food webs (Vilà et al., 2011).

Altered vegetation structure may create favorable conditions for certain insects, such as mosquitoes or ticks, by providing shelter, stable humidity, or alternative nectar sources. Changes in plant community composition have been shown to affect vector population dynamics and pathogen transmission potential, thereby linking invasive plants to zoonotic disease risks through ecosystem-mediated pathways (Allan et al., 2010).

Similarly, invasive weeds can influence microbial communities in soil and plant-associated environments. Through root exudates and allelopathic compounds, invasive plants may reshape soil microbial assemblages, potentially affecting nutrient cycling and the persistence of plant and animal pathogens (Inderjit and van der Putten, 2010). Such changes can indirectly impact crop health, livestock exposure, and food safety.

Integrating One Health into the Management of Invasive Weeds: Policy and Strategic Perspectives

Effective management of invasive weeds requires approaches that simultaneously address ecological integrity, animal health, and human well-being. Despite this, it is still

predominantly framed within sectoral policies, with limited integration of health-related considerations into agricultural and environmental decision-making (Destoumieux-Garzón et al., 2018).

At the European level, invasive alien species are addressed through a combination of biodiversity, agricultural, and phytosanitary policies, including Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species. However, health dimensions particularly those relevant to the One Health concept are often treated implicitly rather than explicitly. Strategic planning instruments such as the Common Agricultural Policy (CAP) Strategic Plans provide a potential entry point for integrating One Health principles into invasive weed management, especially in countries with extensive agricultural landscapes and high exposure of humans and animals to invasive plants.

CAP Strategic Plans emphasize sustainability, ecosystem services, and risk reduction in agricultural systems, creating opportunities to incorporate invasive weed control as a cross-cutting priority. Measures related to agri-environment-climate commitments, eco-schemes, and rural development can indirectly mitigate One Health risks by promoting diversified cropping systems, reduced disturbance, and improved habitat quality. By limiting the establishment and spread of invasive weeds, such measures may reduce allergenic pollen loads, toxic plant exposure to livestock, and habitat conditions favorable to disease vectors (European Commission, 2026).

In Serbia, although not an EU Member State, alignment with EU policies through the accession process and national strategic planning offers a framework for adopting integrated approaches to invasive weed management. Existing national lists of invasive plant species and proposed control measures (Lazarević et al., 2012; Stojanović and Jovanović, 2018) provide a scientific foundation, but their translation into practice remains uneven. Embedding invasive weed management within broader strategies for agricultural sustainability, biodiversity conservation, and public health would strengthen coherence and effectiveness.

From a One Health perspective, prioritization of invasive weeds should extend beyond their economic impact on crop yields to include indicators such as allergenic potential, toxicity to animals, and capacity to alter ecosystem processes linked to disease regulation.

Integrated management also requires cross-sectoral cooperation among agricultural authorities, environmental agencies, public health institutions, and research organizations. Surveillance systems that combine ecological monitoring with health data such as pollen counts, poisoning incidents, or vector abundance can enhance early warning and response capacity. Such systems are consistent with the One Health paradigm and can inform adaptive management under changing climatic and land-use conditions (Hueston et al., 2013; Zinsstag et al., 2020).

Overall, incorporating One Health principles into invasive weed policy and management frameworks offers a pathway toward more holistic and preventive strategies. By recognizing invasive weeds as indirect vectors of health risk and ecosystem degradation, policymakers and practitioners can move beyond reactive control toward proactive,

integrated solutions. This synthesis underscores the need for harmonized criteria, science-based prioritization, and strategic alignment between invasive species management and broader agricultural and health policies, particularly in regions such as Southeast Europe where ecological, agricultural, and health systems are tightly interconnected.

CONCLUSION/FUTURE PERSPECTIVES

The evidence synthesized in this review confirms that invasive weeds represent a multifaceted challenge situated at the intersection of ecosystem integrity, animal health, and human well-being. Their impacts extend far beyond agronomic or conservation concerns, encompassing allergenic exposure, toxicological risks, and ecosystem-mediated pathways that influence disease dynamics and environmental resilience. Within this context, the One Health framework provides a scientifically robust and conceptually coherent approach for understanding and managing invasive weeds as integrated components of socio-ecological-health systems rather than isolated biological stressors.

A key insight emerging from this synthesis is that the consequences of invasive weed spread are often cumulative and synergistic, manifesting through feedback loops between degraded ecosystems, altered species interactions, and increased exposure of humans and animals to allergens, toxins, and pathogens. Such processes are particularly pronounced in agricultural and peri-urban landscapes, where frequent human–animal–environment interactions amplify One Health risks. Recognizing invasive weeds as indirect vectors of health risk reinforces the need to shift from reactive, sector-specific control measures toward preventive, ecosystem-based management strategies.

Despite growing international recognition of the One Health concept, significant knowledge gaps remain, especially in Southeast Europe and the Western Balkans. Data on the health-related impacts of invasive weeds in this region are fragmented, unevenly distributed, and often limited to local case studies or gray literature. Quantitative assessments linking invasive plant abundance with health indicators such as allergen exposure, livestock poisoning, or vector-borne disease risk are particularly scarce. This lack of region-specific, integrative data constrains evidence-based prioritization and limits the transferability of management approaches developed in other biogeographical contexts.

Another critical gap lies in the insufficient integration of ecological, veterinary, and public health research. Invasive weed studies are still predominantly conducted in a fragmented disciplinary manner, focusing either on biodiversity impacts, crop losses, or species distribution, with limited attention to cross-domain interactions. Addressing this limitation requires interdisciplinary and transdisciplinary research designs that combine plant ecology, toxicology, epidemiology, veterinary science, and socio-economic analysis. Such approaches are essential for capturing indirect pathways of risk and for evaluating the full spectrum of One Health outcomes associated with invasive weeds.

Looking ahead, future research should prioritize the development of harmonized assessment frameworks that explicitly incorporate health-related indicators into invasive species risk analysis. Long-term monitoring programs that integrate vegetation surveys with health and exposure data such as pollen monitoring, livestock health records, and vector surveillance would substantially enhance early warning and management capacity.

In parallel, policy instruments and strategic planning frameworks, including agricultural and biodiversity strategies aligned with the Common Agricultural Policy, offer opportunities to operationalize One Health principles at national and regional levels.

In conclusion, advancing invasive weed management through a One Health lens is not only scientifically justified but increasingly necessary in the face of accelerating biological invasions, land-use change, and climate-driven pressures. By acknowledging invasive weeds as integrative risk factors and investing in interdisciplinary knowledge generation, particularly in underrepresented regions such as the Balkans, future efforts can move toward more effective, preventive, and sustainable solutions that protect ecosystems, animals, and human health simultaneously.

REFERENCES

Allan, B.F., Dutra, H.P., Goessling, L.S., Barnett, K., Chase, J.M., Marquis, R.J., Pang, G., Storch, G.A., Thach, R.E., Orrock, J.L., Ostfeld, R.S. (2010). Invasive honeysuckle eradication reduces tick-borne disease risk by altering host dynamics. Proceedings of the National Academy of Sciences, 107(43), 18523-18527. doi: 10.1073/pnas.1008362107

Bàrberi, P. (2019). Weed management in organic agriculture: Are we addressing the right issues? Weed Research, 59(1), 1-3. doi: 10.1046/j.1365-3180.2002.00277.x

Bielory, L., Lyons, K., Goldberg, R. (2012). Climate change and allergic disease. Current allergy and asthma reports, 12(6), 485-494. doi: 10.1007/s11882-012-0314-z

Botha, C.J., Penrith, M.L. (2008). Poisonous plants of veterinary and human importance in southern Africa. Journal of Ethnopharmacology, 119(3), 549-558. doi: 10.1016/j.jep.2008.07.022

Callaway, R.M., Ridenour, W.M. (2004). Novel weapons: invasive success and the evolution of increased competitive ability. Frontiers in Ecology and the Environment, 2(8), 436-443. doi: 10.1890/1540-9295(2004)002[0436:NWISAT]2.0.CO;2

Chen, W.B., Chen, B.M. (2019). Considering the preferences for nitrogen forms by invasive plants: a case study from a hydroponic culture experiment. Weed Research, 59(1), 49-57. doi: 10.1111/wre.12344

DAISIE (2026). Delivering Alien Invasive Species Inventories for Europe. www.europe-aliens.org/

Destoumieux-Garzón, D., Mavingui, P., Boetsch, G., Boissier, J., Darriet, F., Duboz, P., Fritsch, C., Gray, G., Renaud, F., Voituron, Y. (2018). The One Health concept: 10 years old and a long road ahead. Frontiers in Veterinary Science, 5, 14. doi: 10.3389/fvets.2018.00014

DiTomaso, J.M., Monaco, T.A., James, J.J., Firn, J. (2017). Invasive plant species and novel rangeland systems. In Rangeland systems: processes, management and challenges (pp. 429-465). Cham: Springer International Publishing.

Early, R., Bradley, B.A., Dukes, J.S., Lawler, J.J., Olden, J. D., Blumenthal, D.M., Gonzalez, P., Grosholz, E.D., Ibañez, I., Miller, L.P., Sorte, C.J.B., Tatem, A.J. (2016). Global threats from invasive alien species in the twenty-first century and national response capacities. Nature Communications, 7, 12485. doi: 10.1038/ncomms12485

EPPO (2026). EPPO Global Database: Invasive alien plants in Europe. EPPO Bulletin, 51(1), 1-4.

Essl, F., Bacher, S. Blackburn, T., Booy, O., Brundu, G., Brunel, S., Cardoso, A., Eschen, R., Gallardo, B., Galil, B., García-Berthou, E., Genovesi, P., Groom, Q., Harrower, C., Hulme, P., Katsanevakis, S., Kenis, M., Kühn, I., Kumschick, S., Martinou, A., Nentwig, W., O'Flynn, C., Pagad, S., Pergl, J., Pyšek, P., Rabitsch, W., Richardson, D., Roques, A., Roy, H., Scalera, R., Schindler, S., Seebens, H., Vanderhoeven, S., Vilà, M., Wilson, J., Zenetos, A., Jeschke, J. (2015). Crossing Frontiers in Tackling Pathways of Biological Invasions, BioScience, 65(8), 769-782. doi: 10.1093/biosci/biv082

European Commission (2026). CAP Strategic Plans 2023-2027. European Commission. available at: https://agriculture.ec.europa.eu/cap-my-country/cap-strategic-plans_en

Hoberg, E.P., Brooks, D.R. (2015). Evolution in action: Climate change, biodiversity dynamics and emerging infectious disease. Philosophical Transactions of the Royal Society B, 370, 20130553. doi: 10.1098/rstb.2013.0553

Hulme, P.E. (2014). Invasive species challenge the global response to emerging diseases. Trends in Parasitology, 30(6), 267-270. doi: 10.1016/j.pt.2014.03.005

Hulme, P.E. (2015). Invasion pathways at a crossroad: Policy and research challenges for managing alien species introductions. Journal of Applied Ecology, 52(6), 1418-1424. doi: 10.1111/1365-2664.12470

Hueston, W., Appert, J., Denny, T., King, L., Umber, J. (2013). Assessing global adoption of One Health approaches. EcoHealth, 10(2), 228-233. doi: 10.1007/s10393-013-0851-5

Inderjit, van der Putten, W.H. (2010). Impacts of soil microbial communities on exotic plant invasions. Trends in Ecology & Evolution, 25(9), 512-519. doi: 10.1016/j.tree.2010.06.006

IASV (2011). List of Invasive Species in AP Vojvodina [Internet]. Version 0.1beta. Anačkov G, Bjelić-Čabrilo O, Karaman I, Karaman M, Radenković S, Radulović S, Vukov D Boža P, editors. Novi Sad (Serbia): Departman za biologiju i ekologiju. http://iasv.dbe.pmf.uns.ac.rs/

Keeler, R.F., Van Kampen, K.R., James, L.F. (Eds.). (2013). Effects of poisonous plants on livestock. Elsevier.

Konstantinović, B., Meseldžija, M. (2007). Poisonous weed species and their significance for cattle production in Serbia region. Proceedings of a Periodical of Scientific Research of Field and Vegetable Crops, 44(1), 325-332.

Lake, I.R., Jones, N.R., Agnew, M., Goodess, C.M., Giorgi, F., Hamaoui-Laguel, L., Semenov, M., Solomon, F., Storkey, J., Vautard, R., Epstein, M.M. (2016). Climate change and future pollen allergy in Europe. Environmental health perspectives, 125(3), 385. doi: 10.1289/EHP173

Lazarević, P., Stojanović, V., Jelić, I., Perić, R., Krsteski, B., Ajtić, R., Sekulić, N. (2012). Preliminary list of invasive species in the Republic of Serbia with general control and management measures as support for future legal acts. Institute for Nature Conservation of Serbia.

Lerner, H., Berg, C. (2017). A comparison of three holistic approaches to health: One Health, EcoHealth, and Planetary Health. Frontiers in Veterinary Science, 4, 163. doi: 10.3389/fvets.2017.00163

Meseldžija, M., Dudić, M., Stipanović, S. (2019). Distribution of the invasive species *Ailanthus altissima* (P. Mill.) Swingle along the Danube Riverbanks on the territory of Novi Sad. Contemp. Agric., 68(1-2), 7-11. doi: 10.2478/contagri-2019-0002

Pe'er, G., Birkenstock, M., Lakner, S., Röder, N. (2021). The Common Agricultural Policy post-2020: Views and recommendations from scientists to improve performance for biodiversity. Volume 3 - Policy brief, Thünen Working Paper, No. 175 - Volume 3, ISBN 978-3-86576-226-9, Johann Heinrich von Thünen-Institut, Braunschweig. doi: 10.3220/WP1620647816000

Pe'Er, G., Finn, J.A., Díaz, M., Birkenstock, M., Lakner, S., Röder, N. *et al.* (2022). How can the European Common Agricultural Policy help halt biodiversity loss? Recommendations by over 300 experts. Conservation Letters, 15(6), e12901. doi: 10.1111/conl.12901

Pyšek, P., Jarošík, V., Hulme, P.E., Pergl, J., Hejda, M., Schaffner, U., Vilà, M. (2012). A global assessment of invasive plant impacts on resident species, communities and ecosystems: the interaction of impact measures, invading species' traits and environment. Global change biology, 18(5), 1725-1737. doi: 10.1111/j.1365-2486.2011.02636.x

Pyšek, P. *et al.* (2020). Scientists' warning on invasive alien species. *Biological Reviews, 95*(6), 1511-1534. doi: 10.1111/brv.12627

Romanelli, C., Cooper, D., Campbell-Lendrum, D., Maiero, M., Karesh, W.B., Hunter, D., Golden, C.D. (2015). Connecting global priorities: Biodiversity and human health. WHO & CBD Report.

Schindler, S., Rabitsch, W., Essl, F., Wallner, P., Lemmerer, K., Follak, S., Hutter, H.P. (2018). Alien Species and Human Health: Austrian Stakeholder Perspective on Challenges and Solutions. Int J Environ Res Public Health, 15(11), 2527. doi: 10.3390/ijerph15112527. PMID: 30424500; PMCID: PMC6266649.

Schirmel, J., Bundschuh, M., Entling, M.H., Kowarik, I., Buchholz, S. (2016). Impacts of invasive plants on resident animals across ecosystems, taxa, and feeding types: a global assessment. Global change biology, 22(2), 594-603. doi: 10.1111/gcb.13093

Smith, M., Cecchi, L., Skjøth, C.A., Karrer, G., Šikoparija, B. (2013). Common ragweed: a threat to environmental health in Europe. Environ Int., 61, 115-26. doi: 10.1016/j.envint.2013.08.005. Epub 2013 Oct 17. PMID: 24140540.

Stegelmeier, B.L., Colegate, S.M., Brown, A.W. (2016). Dehydropyrrolizidine Alkaloid Toxicity, Cytotoxicity, and Carcinogenicity. Toxins, 8(12), 356. doi: 10.3390/toxins8120356

Stojanović, V., Jovanović, S. (2018). Revision of the preliminary national list of invasive alien plant species with proposed control and management measures. Biologica Nyssana, 9(1), 1-28.

Stojićević, D. (2020). Hibridne forme divljeg suncokreta *Helianthus annuus* L.: Rasprostranjenost, varijabilnost i reakcija na herbicide ALS inhibitore. Doktorska disertacija, Poljoprivredni fakultet Beograd.

Šikoparija B, Radišić, P., Pejak, T., Simić. S. (2006): Airborne grass and ragweed pollen in the southern Panonnian Valley--consideration of rural and urban environment. Ann Agric Environ Med., 13(2), 263-6. PMID: 17195999.

The Plant List (2013). The Plant List: A working list of all known plant species. Version 1.1. www.theplantlist.org

Vilà, M., Espinar, J.L., Hejda, M., Hulme, P.E., Jarošík, V., Maron, J.L., Pergl, J., Schaffner, U., Sun, Y., Pyšek, P. (2011). Ecological impacts of invasive alien plants: a meta-analysis of their effects on species, communities and ecosystems. Ecology Letters, 14, 702-708. doi: 10.1111/j.1461-0248.2011.01628.x

Vrbničanin, S. (ed.) (2015). Invazivni korovi: invazivni procesi, ekološko-genetički potencijal, unošenje, predviđanje, rizici, širenje, štete i kartiranje. Beograd, Herbološko društvo Srbije.

Weger, L.A., Pashley, C.H., Šikoparija, B., Skjøth, C.A., Kasprzyk, I., Grewling, Ł., Thibaudon, M., Magyar, D., Smith, M. (2016). The long-distance transport of airborne Ambrosia pollen to the UK and the Netherlands from Central and south Europe. Int J Biometeorollong-distance-1839. doi: 10.1007/s00484-016-1170-7. Epub 2016 Apr 27. PMID: 27121466; PMCID: PMC5127884.

Zinsstag, J., Schelling, E., Crump, L., Whittaker, M., Tanner, M., Stephen, C. (Eds.). (2020). One Health: the theory and practice of integrated health approaches. Cabi.