

AMBROSIA ARTEMISIIFOLIA L. SPREADING IN URBAN ENVIRONMENTS AND POSSIBILITIES OF CONTROL

Branko KONSTANTINović, Maja MESELDŽIJA
and Bojan KONSTANTINović

Faculty of Agriculture, Novi Sad

Konstantinović Branko, Maja Meseldžija and Bojan Konstantinović (2004): *Ambrosia artemisiifolia* L. spreading in urban environments and possibilities of control. - Acta herbologica, Vol. 13, No. 2, 449-452, Beograd.

The ruderal weed species *Ambrosia artemisiifolia* L. is spreading fast and intensively after being transferred into this country from neighbouring countries. Today it is already widespread across Vojvodina and often makes huge, compact communities in sandy and ruderal habitats. Numerous areas where horticultural plants, trees and grassland grow on first and second category soils in and around the City of Novi Sad, on the Danube riverside, the island 'Ribarsko ostrvo' and drainage canals provide ideal habitats for *Ambrosia artemisiifolia* L., enabling its further spreading and increase in numbers. Evaluation of *Ambrosia artemisiifolia* L. abundance and coverage, determination of the most efficient toxic measures for its control, namely of sanitary and environmentally-friendly low toxicity herbicides, and other non-chemical control measures were performed in urban environments over the 2002 -2003 period.

Key words: *Ambrosia artemisiifolia* L., urban environment, control, herbicides

INTRODUCTION

Ambrosia artemisiifolia L. is a ruderal weed species that has spread fast and intensively after having been introduced into this country from neighbouring countries (KONSTANTINOVIĆ, 1999). It belongs to the adventive floristic element and in 1800 it was transferred from North and Middle America into Europe together with the clover seeds. (PRISZTER, 1960; HANSEN, 1976). In the USA and Canada it is considered one of the most important weeds and its control is regulated by numerous legal provisions. Considering the damage that it causes, its control in Hungary has become obligatory and administered under the Regulation of the Ministry of Agriculture that is part of the 1994 Law on Agricultural Soils (LEVENTE et al., 2003). While spreading *A. artemisiifolia* has begun to adapt to open vegetations on sites that had been free of vegetation and mostly of the ruderal type on degraded meadows. It infests almost all crops and plantations. It is fast-spreading and becoming a Cosmopolitan species. Due to its wide ecological valence it is easily becoming the dominant weed under different conditions. It belongs to the therophyte life-form, meaning that it survives unfavourable conditions in the seed form (SOO, 1970). It is also a thermophilous species that germinates throughout spring and summer. Its emergence begins with favourable soil temperatures and lasts until harvest time. However, in ruderal habitats it germinates as late as September. It fructifies abundantly, forming about 150 000 seeds per individual annually, which makes its control extremely difficult and expensive. *A. artemisiifolia* seeds remain germinative for over 40 years, which indicates an extremely high reproduction potential and permanent soil seed bank (LEVENTE et al., 2003).

MATERIAL AND METHODS

A combined assessment of *A. artemisiifolia* L. numbers and coverage was performed employing the method of BRAUN-BLANQUET (1951) on green cultivated areas in the territory of Novi Sad during the vegetation periods of 2002 and 2003. The most efficient and lowest toxic chemical control rates for this allergen species were determined along with the use of efficient low-toxicity herbicides that are sanitary and environmentally sound, as well as mechanical control measures by mowing.

RESULTS AND DISCUSSION

Ambrosia artemisiifolia L. is today a widespread ruderal weed species in Vojvodina and it often makes huge, compact communities, mostly on free and open biotopes, in sandy and ruderal habitats. It is evidently a frequent weed in various crops and agro-biocenoses. In cooperation with the local government of the city of Novi Sad, Department of Municipal Affairs, and within the framework of its project, the mapping, determination of numbers and coverage, and control of the

allergen species *Ambrosia artemisiifolia* L. on the territory of Novi Sad, as well as further monitoring of retrovegetation or occurrence of new generations of this plant species were performed. Over the April - November periods in 2002 and 2003, field studies were carried out on the territory of the City of Novi Sad, i.e. on cultivated areas such as parks, squares and gardens, as well as on uncultivated green areas such as canals, ditches, waste disposal sites, riversides, ruderal habitats and unregulated construction sites. The species *Ambrosia artemisiifolia* L. was found on over 100 localities on the territory of 21 city zones of around 90 ha in size (Table 1). In cooperation with the firms JKP Gradsko Zelenilo and AD Ciklonizacija, Novi Sad, mechanical control by mowing and, on certain sites, even chemical control were performed at the time of massive occurrence of *A. Artemisiifolia* on the determined localities. Chemical control was done by herbicides based on glyphosate, whose sound ecotoxicological and sanitary characteristics make this active ingredient safe to be used around human settlements (MITIC, 2002). After applying control measures, we monitored the occurrence of new generations of *A. artemisiifolia* and retrovegetation, such as are frequent in cases of mowing on rough terrains. Based on data acquired during the monitoring period May - November, control measures were repeated as required on certain locations. *A. artemisiifolia* L. numbers in the territory of Novi Sad was significantly reduced during the two years of study of its occurrence and control. On certain localities we determined the presence of the ruderal species *Iva xanthifolia* Nutt., another newly-introduced species in our country that, together with *Ambrosia artemisiifolia* L., belongs to the family *Asteraceae*. The threat of this species is in its strong competitiveness, huge seed production and strong allergenic properties.

Table 1. - Spread of *Ambrosia artemisiifolia* L.
in city zones of the City of Novi Sad

No.	City zone	Average individuals no. /m ²
1.	Liman	4-23
2.	Detelinara	12-84
3.	Donji Ribnjak	2-66
4.	Kej	3-19
5.	Novo naselja	6-30
6.	Mali Beograd	5-7
7.	Avijaticarsko naselje	21-44
8.	Industrijska zona	8-23
9.	Sremska Kamenica	3-23
10.	Petrovaradin	9-over 100
11.	Dunavac-Ribarsko osrtvo	39-over 100
12.	Stari grad	26-31
13.	Gradsko groblje	10-25
14.	Institut za topolarstvo-Kacka suma	5-12
15.	Autoput Beograd-Novu Sad	17-30.5
16.	Veternik	9-42
17.	Salajka	7-31
18.	Miseluk	10-15
19.	Telep	10-30
20.	Kamenjar	2-20
21.	Adice	7-12

CONCLUSION

The numbers of the allergen species *Ambrosia artemisiifolia* L. were reduced by combined mechanical and chemical control measures in the territory of the City of Novi Sad over the period 2002-2003. However, the problem can hardly be considered settled as the surrounding areas, non-agricultural as well as agricultural, remain a source of potential infestation. This species requires control by contact herbicides in soybean, sugarbeet, maize and sunflower crops.

REFERENCES

- BRAUN-BLANQUET, J. (1951): Pflanzensozioologie. Wien.
HANSEN, A. (1976): *Ambrosia* L. in Tutin, T.G. et al. ed. *Flora Europaea*, Cambridge University press. Cambridge, 4: 142-143..
KONSTANTINOVIĆ, B. (1999): *Ambrosia artemisiifolia* L. (*A. elatior*). *Biljni lekar*, 4: 370-372.
LEVENTE, K., LASZLO, V., GYULA, B. (2003): A parlagfu (*Ambrosia artemisiifolia* L.) elleni biológiai vedekezés lehetosegi. *Novenyvedelem*, 39: 319-331.
MITIĆ, N. (2002): Pesticidi u poljoprivredi i šumarstvu u Jugoslaviji. Društvo za zaštitu bilja. Beograd.
PRISZTER, SZ. (1960): Adventiv gymnovényeink terjedése. A Keszthelyi Mezőgazdasági Akadémia Kiadványai. Mezőgazdasági Kiado. Budapest.
SOO, R. (1970): A magyar flora és vegetáció Rendszertani novényszakmai közlései, IV. Akadémiai Kiado, Budapest.

Received March 25, 2004

Accepted April 10, 2004

RAŠIRENOST *AMBROSIA ARTEMISIIFOLIA* L. U URBANOJ SREDINI I MOGUĆNOSTI NJENOG SUZBIJANJA

Branko KONSTANTINOVIĆ, Maja MESELDŽIJA i Bojan KONSTANTINOVIĆ

Poljoprivredni fakultet, Novi Sad

I z v o d

Ambrosia artemisiifolia L., korovsko-ruderalna vrsta, brzog i intenzivnog širenja, preneti su iz susednih evropskih zemalja i u našu zemlju. Danas je već široko rasprostranjena u celoj Vojvodini i ne retko gradi veoma velike, kompaktne zajednice na peskovitim i ruderalnim staništima. Veliki broj zelenih površina na teritoriji grada Novog Sada (parkovi, skverovi, baste), zemljišta I i II kategorije, dunavsko priobalje, Ribarsko ostrvo i kanali za odvodnjavanje i navodnjavanje, predstavljaju idealna staništa za ambroziju, što omogućava njeno dalje širenje i porast brojnosti. U periodu 2002-2003. godine, u uslovima urbane sredine, vršene su ocene brojnosti i pokrovnosti ambrozije, utvrđivanje najefikasnijih toksičnih mera njenog suzbijanja, primena niskotoksičnih i zdravstveno ekološko bezbednih herbicida za čovekovu okolinu, kao i primena drugih nehemijskih mera suzbijanja.

Primljeno 25. marta 2004.

Odobreno 10. aprila 2004.