Can we really get rid of Japanese knotweed clones? Two years of management tests in Belgium

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Japanese knotweed *Fallopia japonica* is an extremely abundant invasive plant in Belgium and surrounding countries. To date, no eradication method is available for managers facing the invasion of this rhizomatous plant. We tested different chemical herbicides and two application methods (spraying and stem injection), as well as mechanical treatments, on *Fallopia* clones throughout southern Belgium. The tested methods were selected to be potentially usable by Belgian managers, *e.g.* using legally accepted rates for herbicides.

Stem volume, height and density reduction was assessed after one or two years depending on the treatment. No tested method allowed a complete eradication of the clone. However, stem injection with glyphosate-based herbicide caused the highest damage. The year following injection, no sprouts were observed. Two following year, however, stunted shoots sprouted. Among mechanical control measures, repeated cuts combined with native trees cuttings plantations most appreciably reduced knotweed development. The most efficient methods we tested appear as tools for curbing knotweed invasion but are not likely to be used to eradicate the species. As such they should be included in a more integrated control strategy, together with prevention and public awareness campaigns.

Mechanical control

Each method tested on 2 clones

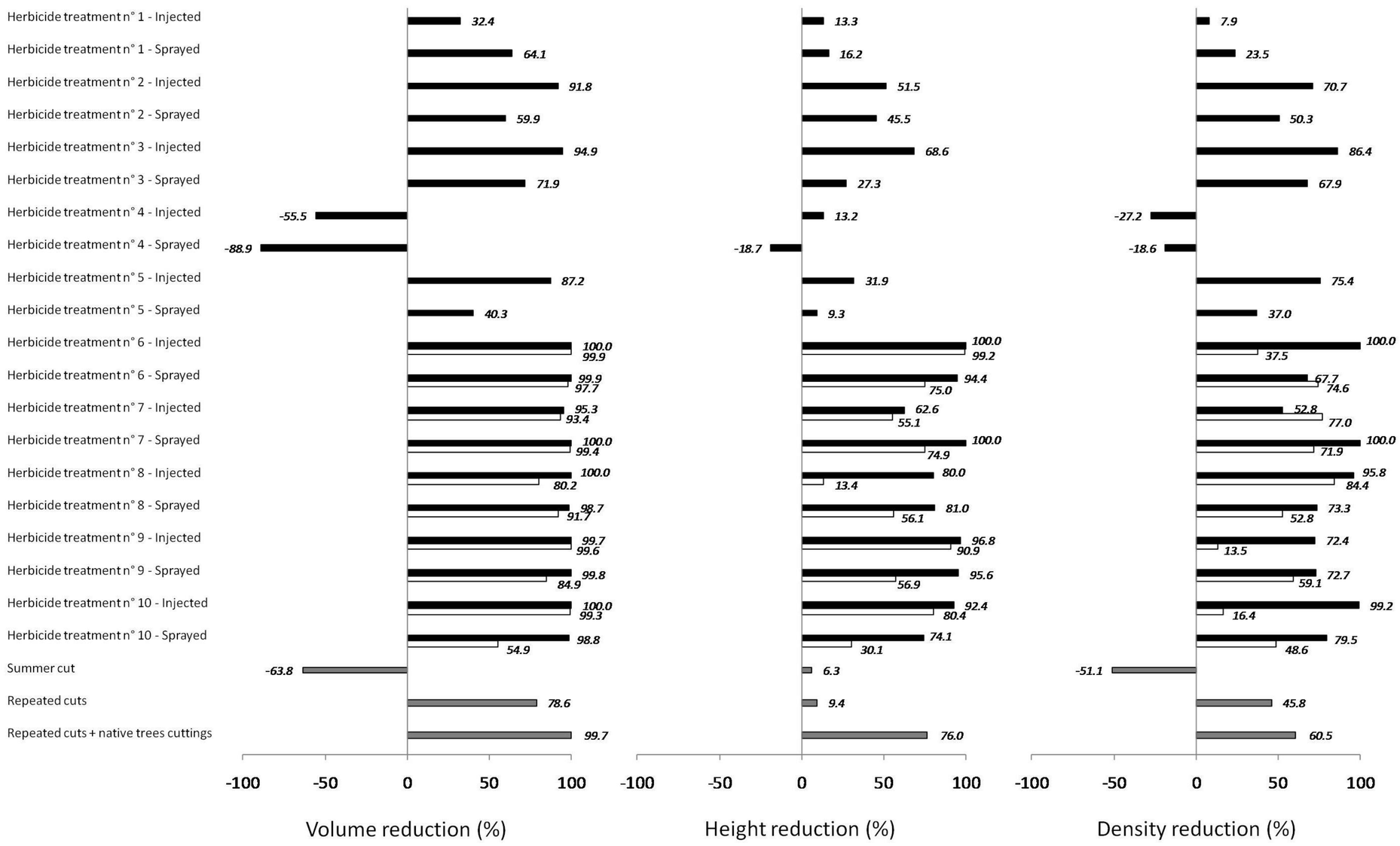
Mechanical treatment	Description
Summer cut	Single cut, performed at the biomass peak in August 2007
Repeated cuts	Monthly cuts from July to October 2006, 2007 and 2008
Repeated cuts + native trees cuttings	Monthly cuts from july to October 2006, followed in spring 2007 by plantation of willow cuttings (*Salix* sp.) with a density of 4 to 5 cuttings.m^{-2}, then by monthly cuts from May to October 2007 and 2008. Monthly cuts during the two last years started earlier to facilitate willow cuttings over knotweed sprouts.

Chemical control

Each herbicide tested using spraying on 2 clones, and using stem injection on 2 other clones

Herbicide treatment	Active ingredients names and concentrations (g.l^{-1})		Authorized dose		Applied dose	
	Formulated herbicide 1	Formulated herbicide 2	Formulated herbicide 1	Formulated herbicide 2	Formulated herbicide 1	Formulated herbicide 2
1	Fluroxypyr (180)	-	0.36	-	0.36	-
2	Fluroxypyr (100) + aminopyralid (30)	-	0.2 + 0.06	-	0.2 + 0.06	-
3	Fluroxypyr (100) + aminopyralid (30)	-	0.2 + 0.06	-	0.4 + 0.12	-
4	Triclopyr (480)	-	7.2	-	7.2	-
5	Triclopyr (240) + aminopyralid (30)	-	0.48 + 0.060	-	0.48 + 0.060	-
6	Glyphosate (450)	-	3.6	-	3.6	-
7	Glyphosate (450)	-	3.6	-	7.2	-
8	Glyphosate (450)	2,4 D Amine (500)	3.6	1.2	3.6	1.2
9	Glyphosate (450)	Triclopyr (480)	3.6	0.72	3.6	0.72
10	Glyphosate (450)	Triclopyr (240) + aminopyralid (30)	3.6	0.48 + 0.06	3.6	0.48+ 0.06

Results



Japanese knotweed stem volume, height and density reduction after the different treatments . Black bars: one year after chemical application; white bars: two years after chemical application; grey bars: three years after mechanical treatment.

Spraying of a Fallopia japonica *clone*

Stem injection

A clone before injection…

… and the same clone two years after injection

Take-home message

- ➔ Stem injection with glyphosate caused important damages to the clones and can curb the clone development, where absolutly needed
- ➔ Among mechanical methods, repeated cuts followed by native trees plantation showed promising results
- ➔ However, no eradication with any of the tested methods: after a recovery period, clones still showed evidence of development
- ➔ Control methods must be integrated in a more integrated managing strategy