

# ÖBB-Infrastruktur AG

We want to get as many people as possible excited about railway travel!



**Thomas Schuh MMSc**  
Sustainability Coordinator

**ÖBB-Infrastruktur AG**  
1020 Vienna, Praterstern 3  
Phone: +43 1 93000 - 44813  
Mobile: +43 664 9603272

E-Mail [thomas.schuh2@oebb.at](mailto:thomas.schuh2@oebb.at)

# Invasive alien plants – A green tsunami

## Contents:

1. Railway tracks and their embankment acc. to Austrian Railway Law
2. Distribution of invasive alien plants along the railway network
3. Control measures – trail and error at ÖBB-Infra AG
4. Back up – further information

# Railway tracks and their embankment acc. to the Austrian Railway Law

Hazard-zone acc. to austrian railway-law §19, 43 and 45

## Safety-distances

Ban on building acc. austrian railway-law §42

Bauverbotsbereich  
12,0 m

Bauverbotsbereich  
12,0 m



max. Baumhöhe

max. Baumhöhe

4 m

4 m

3 m

3 m

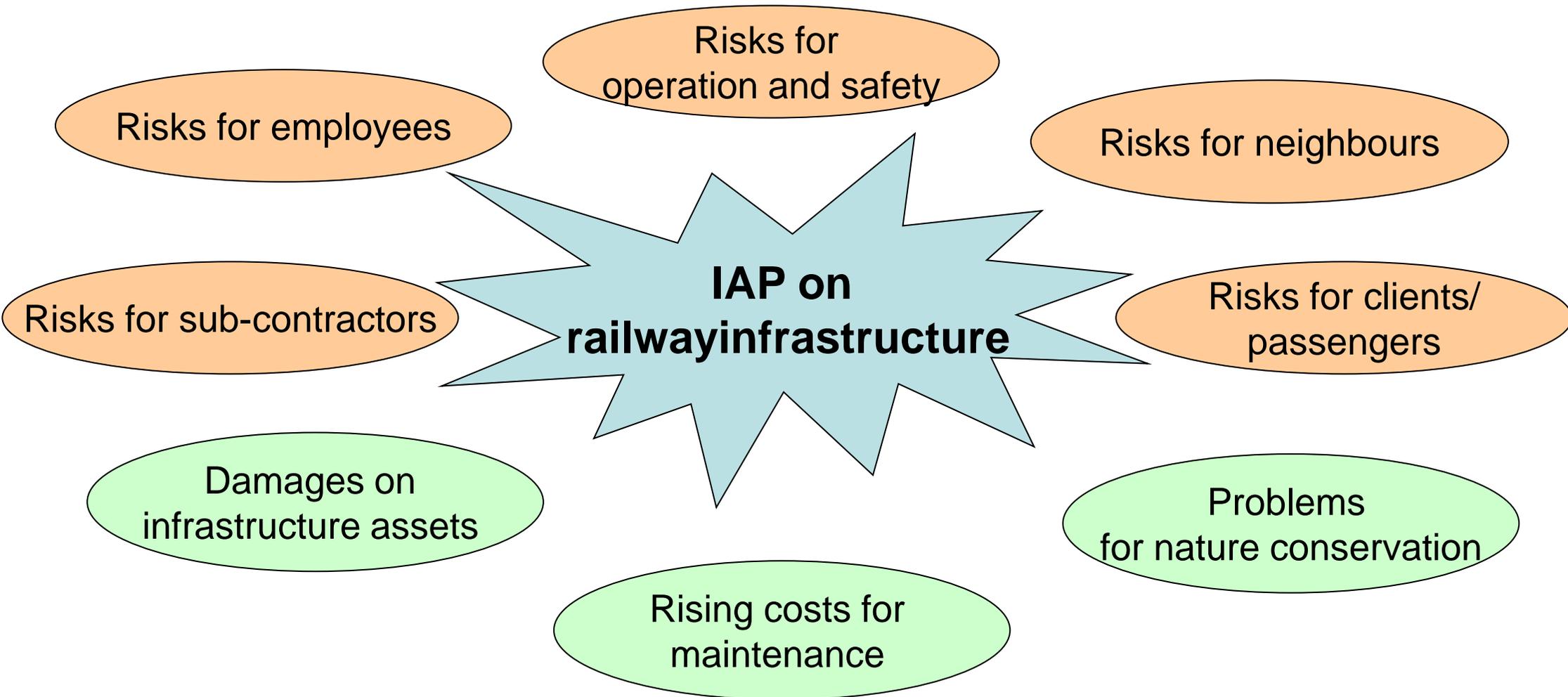
Track area – transportfunction  
No vegetation!

Transition  
area

embankment area – multiple functions  
(ecosystem services, habitat, stepstone  
biotope, landscape, recreation, etc.)

Hazard-zone acc. to austrian railway-law §19, 43 and 45

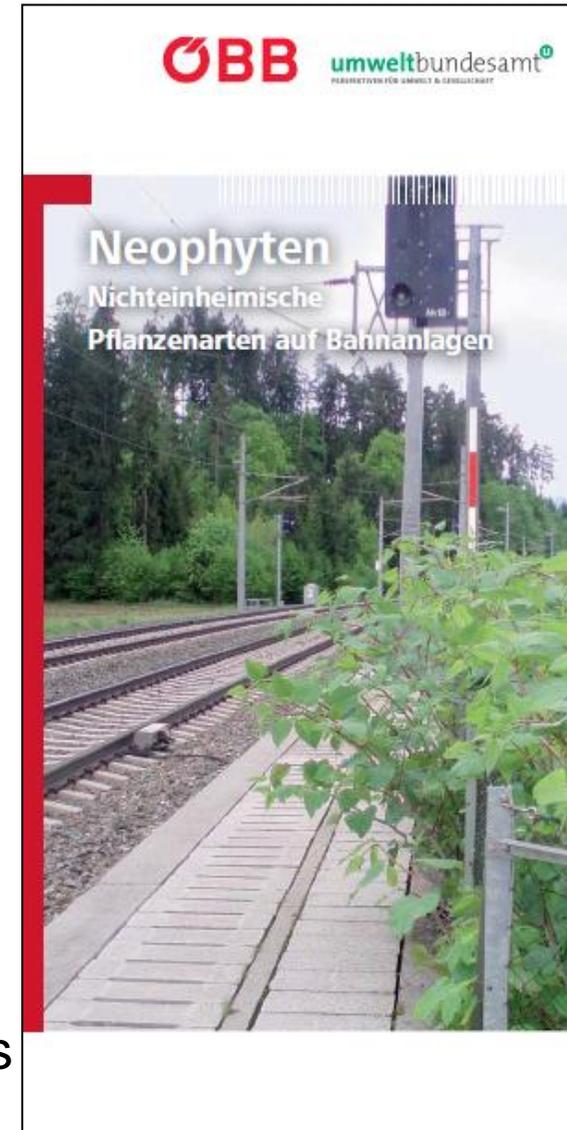
# Invasive alien plants (IAP) – a growing challenge



Estimated damage in Europe: ~ 12.500.000.000 €/a

# Invasive alien plants (IAP) – a growing challenge

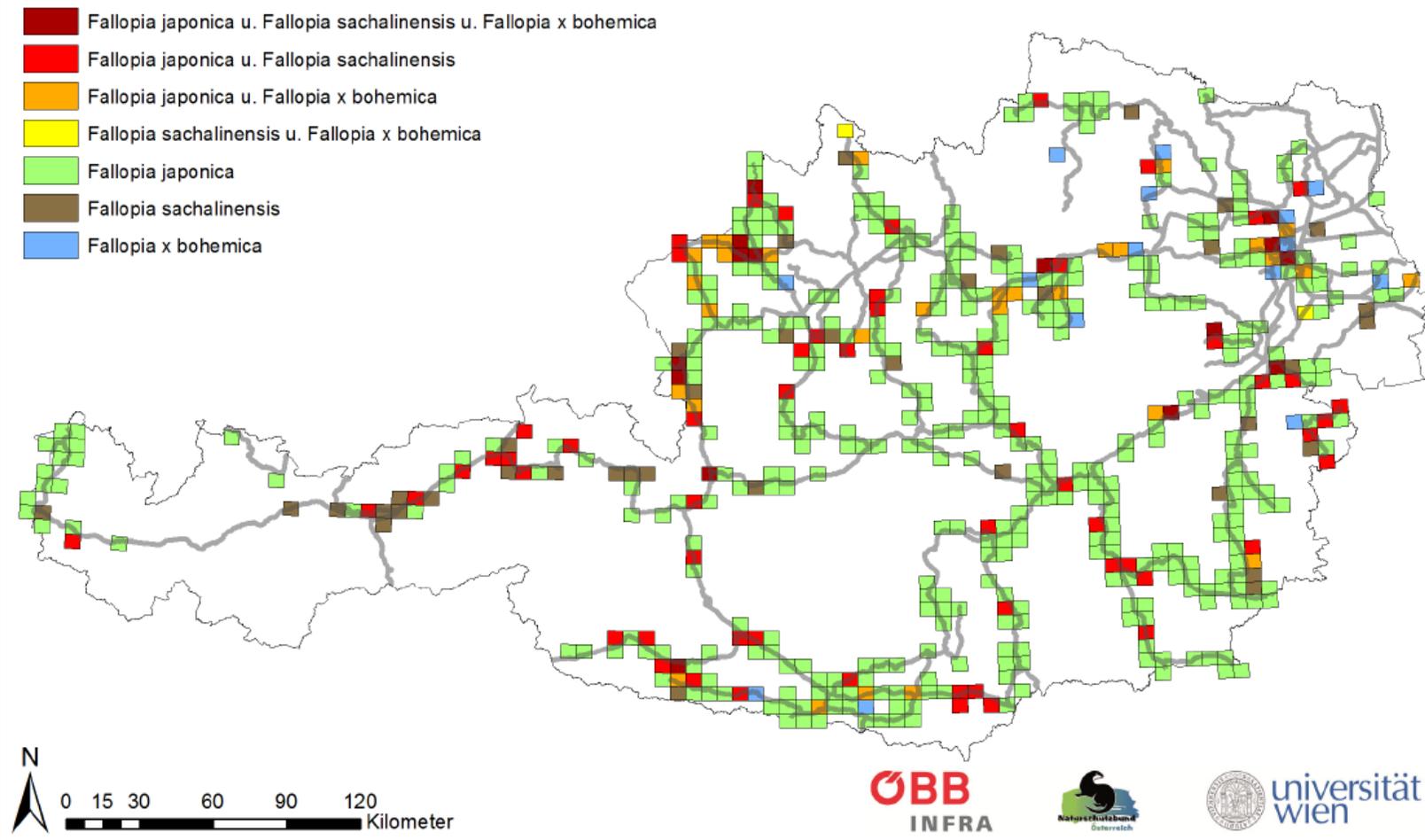
- Info-leaflet with practical hints and accompanying campaign
- Training & awareness rising – internal training seminar rail-ecology, environmental consultants
- Cooperations with Uni. Innsbruck, environment agency austria, federal forests, etc.
- Registration form for the documentation of IAP sites
- GIS - data
- Integration into relevant internal regulations
- Partner in R&D projects, e.g. biolog. eradication of tree of heaven
- Evaluation of mechanical, biological measures
- Eradication from ecological compensating areas and in case of danger for employees, contractors, clients, passengers, or neighbours



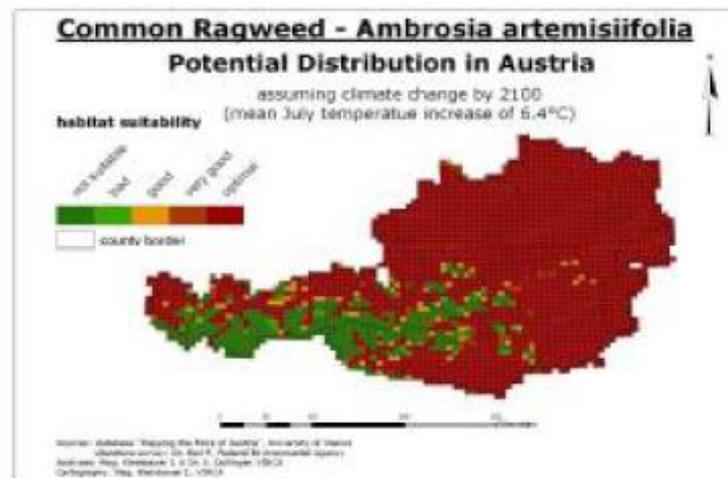
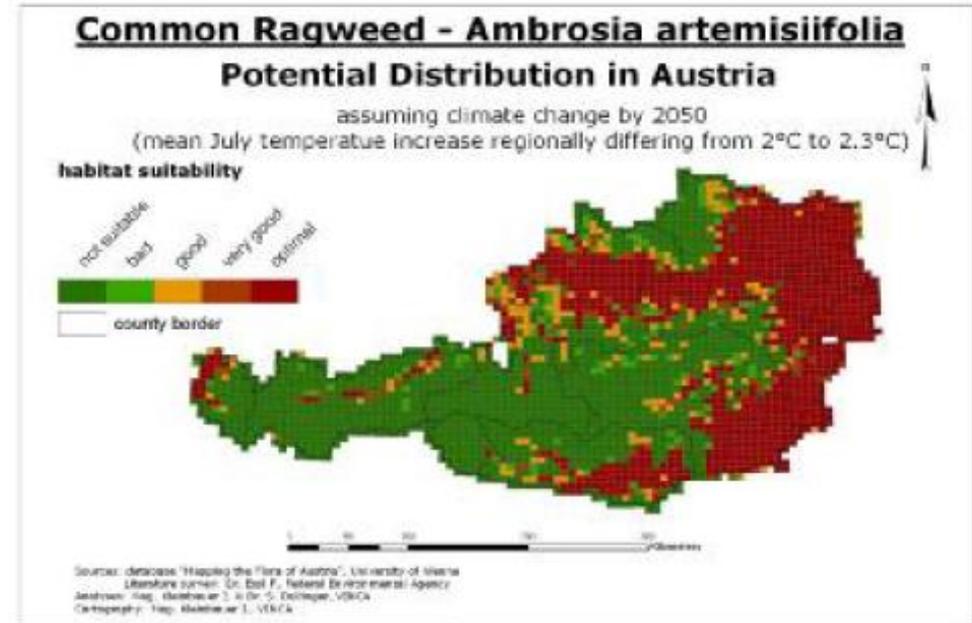
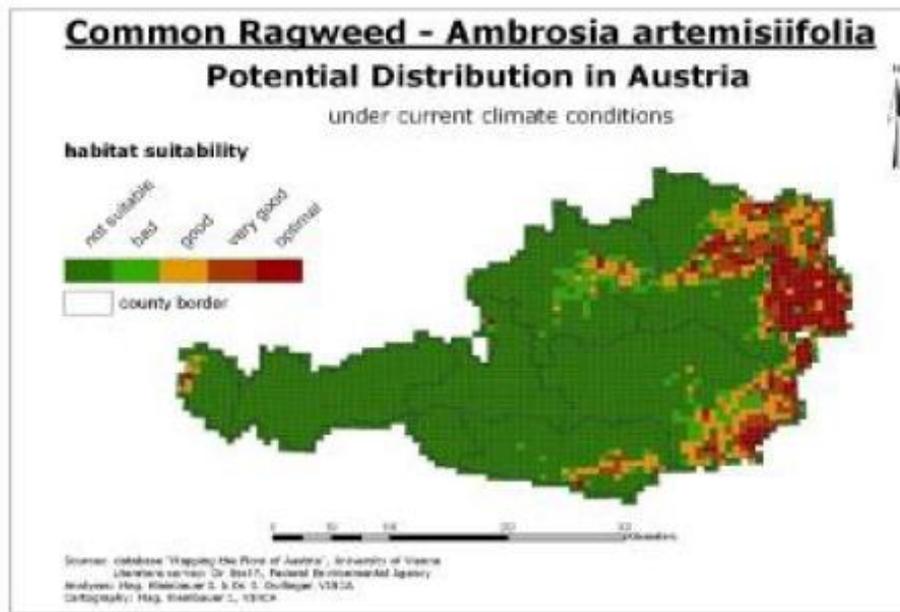
# Distribution of the Japanese Knotweed

Data from the fieldmapping of the flora of Austria (gridsize: 34-35,5 km<sup>2</sup>) was overlapped with GIS data from the austrian railway network.

Trend: IAP are expanding rapidly



# Climate change is providing the ultimate boost



Environment Agency Austria

[www.umweltbundesamt.at](http://www.umweltbundesamt.at)

# Alternative control measures – war on fallopia

Good results on weeds  
in sealed areas

Trials with hot water (98°C, low pressure)  
wave  
<http://www.waveunkrautbekaempfung.de/>  
Application with a lance to damage the  
roots.

**Results:** needs a lot of resources  
(manpower, energy, equipment, money)  
for insignificant effect!



first strike: 24.04.2014



second strike: 30.04.2014



third strike: 13.05.2014



14.08.2014

# Alternative control measures – war on fallopia



Railway dam, overgrown by Fallopia sp.,  
May 2014

**Expected effects:** mechanical  
damages, constriction of stems,  
degradation  
growth of competitor-vegetation

Trials with steelgrids (6x6 and 10x10mm),  
intensified mowing and grazing of goats  
and sheep



Application of steelgrids, 10.04.2014

# Alternative control measures – war on fallopia



Damage by late frost on 9. May 2014

Trials with steelgrids (10x10mm),



Recovery on 28. May 2014



Constriction of  
stems. Gridsize  
10x10mm May 2014



# Alternative control measures – war on fallopia



Trials with steelgrids (6x6 mm),

**Results:** needs quite a lot of resources (manpower, material, money) for little effect so far!

Fallopia damaged by a hailstrom on 23 June 2014.  
Fallopia covered by 6x6 mm steelgred, seemed to be protected, but...

...could only develop  
cripple-growth forms.



# Alternative control measures – war on fallopia

## Grazing with goats and sheep



13 goats and 4 sheep were put on a dam, appr. 7500m<sup>2</sup>, start May 2014

### **Expected effects:**

reduction and mechanical damages,  
no problems with material disposal,  
surface compression of the dam  
growth of competitor-vegetation

classification: ÖBB-Infrastruktur AG/Stab BL (public)

### **Success factors:**

motivated railway colleagues  
cooperative, innovative farmer  
animal friendly conditions (water,  
shade, etc)  
calm and healthy animals  
internal and external communication

ÖBB-Infrastruktur AG/Th. Schuh

# Alternative control measures – war on fallopia

Grazing with goats and sheep



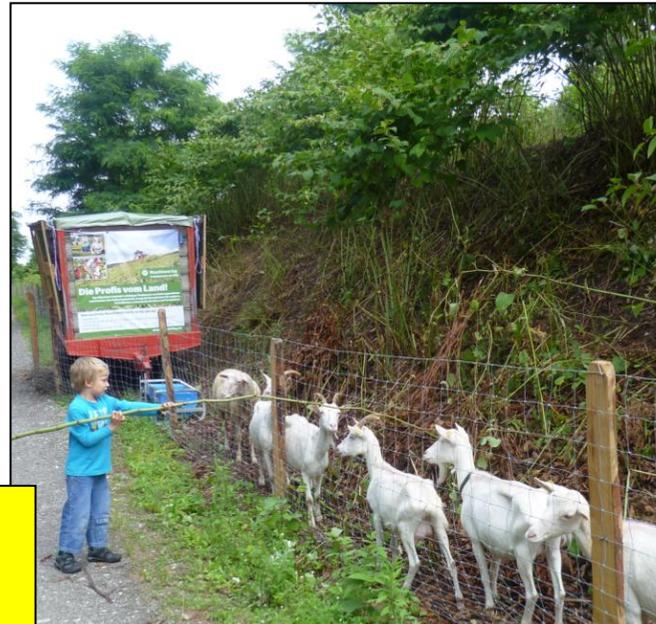
Summer 2015,  
grazing makes the difference

18.07.2014

27.07.2014

# Alternative control measures – war on fallopia

## Grazing with goats and sheep



**Results:** needs quite a lot of resources (manpower, material, money specifically at the start!) for multiple effects so far!

- Significant reduction of Fallopia and goldenrod, maybe also robinia
- Improved landscape scenery of the dams
- Very positive media reports
- Very positive feedback from the public
- Awareness raising of the staff and the public
- Creation of a local value chain for farmers

# Alternative control measures

## – biological control of tree of heaven



- Screening for candidates suitable for biological control of *Ailanthus* → First report of the wilt-causing pathogen *Verticillium nonalfalfae* in Europe isolated from *Ailanthus*
- *In-vitro* propagation of the pathogen and production of a spore suspension for artificial treatment
- Investigations on young and mature *Ailanthus* trees indicated high mortality of treated trees
- Comprehensive studies (starting 2011) concerning
  - dosage and formulation
  - appropriate application methods
  - optimal date of treatment
  - natural distribution of the pathogen
  - „non-target-effects“?

# Effect on young Tree of Heaven

2013-07-19



2014-10-13



2014-07-24



2015\_07\_08





# University of Natural Resources and Life Sciences, Vienna (BOKU)



University of Natural Resources  
and Life Sciences, Vienna  
Department of Forest- and Soil Sciences

## Department of Forest and Soil Sciences

Institute of Forest Entomology, Forest Pathology and  
Forest Protection (IFFF)

### Erhard Halmschlager

Peter-Jordan-Straße 82, A-1190 Wien

Tel.: +43 1 47654-91620

erhard.halmschlager@boku.ac.at

### Oliver Maschek

Peter-Jordan-Straße 82, A-1190 Wien

Tel.: +43 1 47654-91622

oliver.maschek@boku.ac.at



viadonau





**Thank you for your attention!**

# Back-up



# Invasive alien plants (IAP) – a growing challenge

So-called:  
“siderodromophiles“ IAP,  
which are commonly found  
on railways and are  
spreading dramatically!



**Tree of heaven** (*Ailanthus altissima*)



**Japanese knotweed** (*Fallopia* sp.)



**Robinia** (*Robinia pseudoacacia*)

# Invasive alien plants (IAP) – a growing challenge



**Jewelweed** (*Impatiens glandulifera*)



**Canada Goldenrod** (*Solidago canadensis*)

# Invasive alien plants (IAP) – a growing challenge



**Ragweed (*Ambrosia artemisiifolia*)**

**Giant Hogweed (*Heracleum mantegazzianum*)**