



**LIFE 08 NAT/E/000072**

**RECOVERY OF THE RIPARIAN HABITATS ON THE TER  
RIVER**

## **ACTION PLAN**

**Chemical control of tree of heaven**

*(Ailanthus altissima)*

**Chemical control of black locust**

*(Robinia pseudoacacia)*

## MANAGEMENT OPPORTUNITIES AND EXPERIENCES FOR THE CONTROL OF TREE OF HEAVEN (*Ailanthus altissima*) and BLACK LOCUST (*Robinia pseudoacacia*) IN RIPARIAN FORESTS

### CONTEXT

The tree of heaven and black locust are two exotic trees with clearly invasive behaviour that can occupy and transform natural environments, especially in riparian habitats. These are two invasive plant species with a major ecological and socio-economic impact on the riverside forests of Catalonia (EXOCAT 2012 Project).

The past introduction of these two species explains why they are so widespread in the region. Both species were and continue to be considered ornamental trees, although their spread can be attributed mainly to use of the black locust's wood as timber and use of the tree of heaven for stabilising riverbanks. In addition to this, it is very difficult to eradicate them once they have become established, as there are no effective mechanical methods of controlling them.





## BACKGROUND


In order to find a method of controlling the tree of heaven and black locust, various actions have been carried out in the Girona region between 2006 and 2012 to assess the chemical control of these species. The tests carried out have led to the development of a plan for controlling these trees.


These actions have been led by Galanthis (Centre for environment studies and dissemination) within the framework of various projects funded by the public authorities in different natural spaces throughout the province. The most recent of these, which is directly linked to riparian environments, was carried out during 2012 within the framework of the LIFE RIPARIA-TER project, with conservation activities focusing on eradicating these two species.


### Biological characteristics that favour their invasiveness


 Both species reproduce by seeds, producing a large quantity of viable seeds.

 They have a strong ability to resprout and propagate vegetatively through root sprouts.

 They are highly competitive in dry conditions and can grow in a great variety of environments, terrains, altitudes, etc.

 They are species that grow well in full sunlight, particularly in anthropically disturbed areas.

 The seeds are dispersed effectively by the wind and/or by the water in riparian environments.

 These species are capable of transforming their surroundings. In the case of the tree of heaven, it produces allelopathic substances, while the black locust tree enriches soils with nitrogen due to its mycorrhizae, displacing native plant species.

## MANAGEMENT NEEDS AND OPPORTUNITIES

<i>Species</i>	<i>Spread</i>	<i>Management needs</i>	<i>Opportunities</i>
<i>Black locust</i>	<i>The black locust is very widespread in the province of Girona. The invasiveness of this tree has reached saturation point and it is not feasible to eradicate it completely in the region.</i>	<i>The management needs must focus on controlling certain places situated in large areas that are still free from black locust trees and in places of high conservation value (habitats and species whose conservation is a priority).</i>	<i>There are limited opportunities for reducing the pressure of this invasive species which does not appear Annex I of Royal Decree 1628/2011.</i>
<i>Tree of heaven</i>	<i>It is considered that the spread of the tree of heaven is at an initial stage, affecting many built-up areas, but it may still be possible to eradicate it.</i>	<i>The management needs can be broken down according to different degrees of priority for its eradication in the natural environment (maximum priority for females and stands of trees in highly dynamic environments). In second place is the need to replace ornamental trees where their seeds could easily be dispersed in the natural habitat.</i>	<i>Essentially, the objectives are to stop its spread and ensure its inclusion in Annex I of Royal Decree 1628/2011 and consequently stop it from being used as an ornamental tree.</i>

## **METHOD OF CHEMICAL CONTROL**

With easy access to the base of the trees that are going to be treated, which often involves clearing the vegetation beforehand, the treatment is applied by drilling holes in the trunk and injecting two active ingredients: Picloram and Triclopyr. This results in translocation of the herbicides, which kills the tree's entire root system, thus preventing resprouting. Trees are treated during the months of May and June, and the treatment consists of several different steps:

### ***DRILLING***

Holes are drilled in the base of the trunks using a no. 8-10 drill bit, making a 2-cm hole at an angle of approx. 45°. The number of holes will be directly proportional to the circumference, making a hole every 4 cm. For stems with a diameter of less than 2 cm, a single hole may be made in the base.

### ***APPLICATION***

The two active ingredients cannot be mixed in a single solution, as they each come in a different formulation in Spain: Tordon 22 K (Picloram) is polar and Garlon 4 (Triclopyr) is apolar. This means the two substances must be applied separately, one after the other.

They are injected using an automatic syringe (used by vets to administer medication to livestock) to achieve a clean, precise application.

First, 1 ml of a 6% Picloram solution (in water) is injected into each hole.

Then, once the first product has been absorbed (after half an hour) 1 ml of a 24% Triclopyr solution (in paraffinic oil) is injected.

### ***MAINTENANCE***

Maintenance is carried out during September or October to eliminate any resprouting, which is expected to be low density. Tests have been carried out, with good results, applying 3% Glyphosate by foliar spraying using a low pressure backpack sprayer.

## FACTORS TO CONSIDER



The products must be applied taking into consideration all the necessary safety measures and following the pertinent regulations.



During the work required to enable access for application of the products, it is important not to clear plants with a smaller diameter.



For the tree of heaven, all trunks must be treated if possible, including thinner ones, especially in stands of female trees where there will be individual seed plants.



The treatment must only be applied during the recommended time of year (May and June, when the tree is at its most productive). When treatments are applied to plants during a dormant period, this will kill the aerial part but will lead to excessive resprouting the following spring.



It is important to make sure that the herbicides are applied as soon as possible after drilling the holes to ensure the maximum response.



If dead wood is removed, it is important to ensure that the terrain is disturbed as little as possible to prevent the activation and germination of seeds.



It is essential to carry out checks and maintenance throughout the first year to ensure the complete eradication of these trees.











Extra precautions must be taken when there is surface water near the trees that are going to be treated. Care should be taken to avoid accidental spillage of the product.



Livestock must be prevented from entering the treated area for the length of time recommended on the safety label of the phytosanitary products.

## CONCLUSIONS

-  The tree of heaven and black locust can be managed by chemical control.
-  The overall cost of treating high-density tree of heaven stands is estimated to be about €1 / m<sup>2</sup>.
-  The cost is generally lower for black locust, as they have a lower density structure in most cases, although they do cover extensive surface areas.
-  Despite the possibility of controlling them, the economic cost is high and the use of herbicides poses certain environmental risks.
-  The desired results can only be achieved within a space of two months (May - June), which is a considerable limitation.
-  Outside this ideal treatment period, the results are counter-productive, as it favours resprouting of the root system.
-  The maintenance treatments are not expensive, but they are crucial for the complete eradication of these trees.
-  It takes a minimum of one year to eradicate a stand of trees, including the initial treatment and two maintenance treatments, one in autumn and another in spring.