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European and Mediterranean Plant Protection Organization
Organisation Européenne et Méditerranéenne pour la Protection des Plantes PM 9/23 (1)

National regulatory control systems
Systèmes de lutte nationaux réglementaires

PM 9/23 (1) *Baccharis halimifolia*

Specific scope

This Standard describes control procedures aiming to monitor, contain and eradicate *Baccharis halimifolia*.

Specific approval and amendment

First approved in 2016-09

Introduction

Details on the biology, distribution and economic importance of *Baccharis halimifolia* can be found in EPPO (2014).

Baccharis halimifolia is a branching shrub or small tree growing up to 4 m in height and native to North-America. Within the EPPO region, the species is recorded in Belgium, France, Italy, Spain and the United Kingdom. It was introduced as an ornamental plant, and is now reported to be used in soil bioengineering systems to stabilize tidal shorelines because of its ability to root from a dormant, unrooted cutting (Invasive Alien Species in Belgium website). The species has also been introduced in Australia and in New Zealand as an ornamental plant, where it is now considered invasive and is regulated.

Baccharis halimifolia reproduces mainly by seeds, but can also reproduce vegetatively by sprouting from the base following disturbance (Westman *et al.*, 1975). Shrubs mature within 2 years and flower every year (Panetta, 1979a). Seeds are produced from October to November (in France). Seeds are abundant – estimates range between 10 000 (Auld, 1970) and 1 500 000 per year for a healthy adult plant growing in full sunlight (Westman *et al.*, 1975) – and are dispersed by wind, potentially over long distances as they are very small (weighing only 0.1 mg), as well as by water. The seed germination rate is estimated to be between 70% and 99% (Panetta, 1979b).

On the Atlantic coast of Europe, *B. halimifolia* is known to escape from cultivation (private gardens, hedges and roundabouts) and to establish first in artificial habitats: along roadsides, along canals and in agricultural, industrial or on old saltworks wastelands (Le Moigne & Magnanon, 2009). From these habitats, it invades coastal wetlands such as saltmarshes (with an optimum in *Juncus maritimus* communities; see Caño *et al.* 2013), moist and wet dune slack, water-fringing reedbeds, meadows and open woodlands (Muller, 2004) and humid prairies (Zendoia *et al.*, 2006). In the Basque country and in the Asturias it also invades coastal cliff vegetation (Gobierno Vasco, 2014a,b).

Baccharis halimifolia can outcompete other plants. In its native range, *B. halimifolia* is considered a weed as it invades overgrazed rangeland in the Southern United States (Nesom, 2006). In Australia, *B. halimifolia* is a pest of pastures, where thick stands can inhibit the movement of stock and reduce the productivity of grazed areas (Ensbey, 2001). It forms dense monospecific stands that are persistent, as each shrub can live for up to 25 years, and can have detrimental impacts on native populations and communities. Once established, the shrub blocks the light to other species, modifying micro-climatic conditions and leading to a reduction of herbaceous species (Muller, 2004) as well as to a reduction of species richness overall (Pierre, 2012; Fried *et al.*, 2014) and a marked change in the structure and physiognomy of the invaded community (Campos *et al.*, 2004). As leaves and wood of *B. halimifolia* secrete an inflammable resin (Bean, 1981), dense thickets of *B. halimifolia* could increase fire frequency in invaded habitats (Muller, 2004). Impacts are recorded to occur in threatened habitats listed in Annex I of the EC Habitats Directive (Directive 92/43), in particular in France and in Spain. In addition, *B. halimifolia* may threaten rare or vulnerable species (see the EPPO PRA record for *B. halimifolia* for further details). Dense thickets of *B. halimifolia* protect mosquito larvae from insecticide treatments and impede access for mosquito control (Bouterin & Canonge, 1999 in Muller, 2004). *Baccharis halimifolia* is also reported to cause hayfever-type allergies (Moss, 1967; cited in Panetta, 1979b; DeLoach *et al.*, 1986) to its airborne pollen and seed 'fluff'

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(Anonymous, 2007), but these effects have not been observed in the EPPO region so far.

EPPO member countries at risk are advised to prepare monitoring activities and a contingency plan for the monitoring, eradication and containment of this pest.

This Standard presents the basis of a national regulatory control system for the monitoring, eradication and containment of *B. halimifolia* and describes:

- elements of the monitoring programme that should be conducted to detect a new infestation or to delimit an infested area
- measures aiming to eradicate recently detected populations (including an incursion)
- containment measures to prevent further spread in a country or to neighbouring countries, in areas where the pest is present and eradication is no longer considered feasible.

Regional cooperation is important, and it is recommended that countries should communicate with their neighbours to exchange views on the best programme to implement in order to achieve the regional goal of preventing further spread of the pest.

For the efficient implementation of monitoring and control at a national level, cooperation between the relevant public bodies (e.g. NPPOs, environment ministries, transport ministries, water management bodies, etc.), as well as with other interested bodies (nature reserves, associations) should be established.

Monitoring of *Baccharis halimifolia*

Staff of organizations in charge of monitoring the species should be trained to recognize the plant even when it occurs in small populations and/or as young plants (<2 years). This may include nature conservation managers as well as botanists, staff of NPPOs, etc. Flowering is very conspicuous and occurs at the end of summer (August to October). The plant can be very easily recognized and spotted at this stage. However, *B. halimifolia* often colonizes remote and impenetrable habitats, rendering its detection difficult.

Regular delimiting surveys (according to the International Standard for Phytosanitary Measures no. 6 *Guidelines for surveillance*) are necessary to determine the geographical distribution of the plant and its prevalence. Monitoring should concentrate on areas that are climatically suitable and most vulnerable to colonization (grasslands and pastures, coastal wetlands, etc.).

Eradication of *Baccharis halimifolia*

The eradication programme for *B. halimifolia* in the case of recently detected populations (including an incursion) is based on the delimitation of the invaded area within the country and the application of measures to both eradicate and prevent further spread of the pest. The feasibility of eradicating *B. halimifolia* depends on the size of the area infested, the density of the plants, the size of the accumulated seed bank and the accessibility of the site.

Eradication measures are described in Appendix 1.

Containment of *Baccharis halimifolia*

The containment programme for *B. halimifolia* in the case of established populations is based on the application of measures to prevent further spread of the pest in the country or to neighbouring countries. These measures are described in Appendix 2.

Communication and collaboration

The first step in controlling *B. halimifolia* is to stop its use as an ornamental plant, in particular along roads and near habitats at risk. The species is easily recognizable and nature reserve managers, as well as professionals (administrations, in particular road administrations, the nursery industry, municipal nurseries, private road companies, etc.) should be informed of the threat it may cause to agriculture and human health and as a fire hazard. A management programme would require the activities of the different stakeholders involved to be coordinated for increased efficiency. Citizen science projects may be implemented to encourage landholders and other citizens to report sightings of *B. halimifolia.*

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Appendix 1 – Eradication programme

The national regulatory control system involves four main activities:

1 Surveillance to fully investigate the distribution of the pest.
2 Containment measures to prevent the spread of the pest.
3 Treatment and/or control measures to eradicate the pest when it is found.
4 Verification of pest eradication.

Eradication depends on effective surveillance to determine the distribution of the pest and containment to prevent spread while eradication is in progress. Surveillance must be used to verify if eradication has been successful.

1. Surveillance

A delimitation survey should be conducted to determine the extent of the distribution of the pest. Surveillance should be carried out during the period of growth before and during flowering and before fruiting in likely places of introduction of *B. halimifolia*: along roadsides and along canals and other dispersal corridors, in disturbed areas around

introduction pathways (gardens, nurseries, material for construction work), as well as in uninvaded natural and semi-natural habitats suitable for the species (estuaries, dunes, river banks, cliffs, etc.), in particular when they have a high biodiversity value. Infested areas and adjacent areas that might receive seeds should be monitored. The surveillance of natural or semi-natural habitats (e.g. coastal wetlands, humid prairies) is necessary if the plant has spread from its initial places of introduction and escape, but would be more demanding. The radius of areas to be observed around a mature plant should be that of the maximum dispersal distance of the species (about 5 km) (Department for the Environment and Territorial Policy of the Basque Government, 2014).

2. Containment measures

Unintentional transport of seeds via the transfer of soil material should be avoided. The unintentional transport of seeds through vehicle movement and human activities should be limited as much as possible, implying that travel through invaded areas should be restricted to periods when propagation of seeds is less likely.

Any management measures should be undertaken prior to the flowering of the plant to avoid further seed production and spread. Vegetation residues should also be managed adequately to prevent their possible reestablishment in the environment.

3. Treatment and control programme

High seed production, effective dispersal by wind and the promotion of germination upon exposure to light make management of this species difficult (Westman *et al.*, 1975). If detected very early, young plants (<2 years) could be controlled prior to reproduction, rendering the measure most likely to be successful.

The possible methods for treatment and control depend upon the ecological environment in which they may be applied. The presence of protected or endemic species of flora or fauna should be considered as well as the breeding seasons of fauna, the fragility of the ecosystem, in particular wetlands, and any existing regulations should be checked. Working in marshes and estuaries involves planning actions that take tides into consideration. Problems with access can also occur in areas of complex terrain such as coastal cliffs. The need for means of access that require safety measures (e.g. associated with vertical work) will have to be anticipated (Department for the Environment and Territorial Policy of the Basque Government, 2014).

Chemical control

Herbicides, although initially expensive to apply, may give long-term control. Treatments with glyphosate, 2,4-D acid or 2,4-D amine achieved over 90% control of *B. halimifolia* in a variety of tests (Auld, 1970; Armstrong & Wells, 1979). Weber (2003) reported that chemical control is providing satisfactory results with 2,4-D, dicamba plus MCPA, glyphosate, picloram plus 2,4-D, and triclopyr. Gann *et al.* (2012) reported that triclopyr was far more efficient in hardwood forest than imazamox, aminopyralid and glyphosate. Combinations of herbicides on foliage to control shrubs (e.g. picloram combined with aminopyralid and triclopyr or 2,4 D combined with dichloprop-p) have provided efficient and long-lasting results still visible after 6 months in France (Commission syndicale de grande Brière Mottière, 2007). Spraying may be performed after a previous clearing (a few months before) to weaken the plant and to reduce the number of shoots on which to spray. The best time for application is between August and October, during flowering of the plant. Efficient herbicides for the control of *B. halimifolia* are listed in Table 1. However, spraying on foliage may spread the active substances to non-target plants and could then transfer to soil and water. The listing of herbicides in Table 1 does not imply that they are approved and available for use in all EPPO countries. Before using chemical products against *B. halimifolia* users should check and follow national regulations.

Herbicides are most efficient when applied on tree stumps (for plants more than 1.5 m in height), just after cutting, and this is particularly efficient when the cut is

Table 1. Herbicides which have been used for the control of *B. halimifolia*, taken from Department for the Environment and Territorial Policy of the Basque Government (2014)

Active substance and concentration	Proportion	Comments
2,4-D 300 g L^{-1}	100 mL in 10 L of water	Complete coverage of the plant is necessary
Glyphosate 360 g L^{-1}	700 mL in 100 L of water	In plants with active growth. Should not be applied in winter or during very dry summers
Picloram 45 g/kg	Not diluted	Application by injection in cut stems: injection of a 3–5 mm layer of gel on stems below 20 mm and of 5 mm on stems over 20 mm
Triclopyr 600 g L^{-1}	160 mL in 100 L of water 320 mL in 100 L of water	Seedlings below 1 or 2 m highSpecimen over 1 or 2 m high
Triclopyr 240 g L^{-1} + Picloram 120 g L^{-1}	1 L per 60 L of oil	Base application on stumps.
2,4-D amine 625 g L^{-1}	320 mL in 100 L of water	Spray over active growing specimen. Cover the specimen

at the soil level (Charpentier *et al.*, 2006). Application of glyphosate and ammonium sulphamate has managed to control 90% of the shrubs/trees treated with the method in an experiment in France (Commission syndicale de grande Brière Mottière, 2007). Application of the herbicide should be made immediately after the cut (within 30 s) to ensure the dose enters the plant, and by authorized staff (Department for the Environment and Territorial Policy of the Basque Government, 2014). It is recommended to apply such a measure in autumn when the sap is going down. This technique greatly reduces the quantities of active substances used, as well as their spread in the environment. In Northern Spain this method has been applied to control the invasion in three estuaries as part of a LIFE+ project (LIFE08NAT/E/0055) (see Fig. 1). Results show that this method is very effective (97% effectiveness) in small or medium-sized invasions, but less effective in large and widespread invasions (70–75% effectiveness). A variant is the basal application, in which banding is performed on the base of the stem, applying herbicide with a brush or paintbrush. The application should be made on each main trunk no more than 50 cm from the soil (Department for the Environment and Territorial Policy of the Basque Government, 2014). Reinvasion of the treated area by seed bank germination must be expected the first year after treatment, and manual control may be applied. Further treatments and surveillance are recommended to ensure the total elimination of the invasion (Gobierno Vasco, 2014b,c).

Herbicides can also be applied on debarked branches. The application of salt to tree roots has been tested but results still need to be confirmed, and the use of salt does not represent a management measure as it is not authorized (Commission syndicale de grande Brière Mottière, 2007).

Injection consists of injecting herbicide inside the stems. This requires an auger or drill to make small holes in the stem about 5 cm apart. The herbicide is then injected (using a dropper, a dosing syringe, an injection gun or a spray bottle), placing a small amount of herbicide in each hole. The holes are then sealed with resin or other material (Department for the Environment and Territorial Policy of the Basque Government, 2014).

The methods of stump and branch herbicide application and injection are suitable for specimens near water, and may be undertaken from March to October.

The ideal times for application of manual and mechanical measures are given in Table 2.

All products should be used following the label instructions and in line with the relevant plant protection product regulations. In the European Union, some herbicides have been phased out as they did not gain Annex I listing during the active review process. The availability of the remaining active substances varies significantly from country to country and the current product approvals are subject to change under the EU review process for plant protection products. Chemical control may in particular not be authorized in nature reserves, especially in humid environments.

Manual and mechanical control

Manual removal of young plants (maximum 1–1.5 m in height) has provided satisfactory results in newly invaded sites (see Fig. 2). Manual removal can only be undertaken on new plants resulting from germination, and not on resprouting plants (Commission syndicale de grande Brière Mottière, 2007). This method has a low impact on the ecosystem and requires simple equipment. However, the whole root system needs to be removed to prevent resprouting and this method is therefore quite expensive and cannot

Fig. 1 Stump application in Urdaibai (Northern Spain) (LIFE+ project, Estuaries of the Basque Country – LIFE08NAT/E/0055). © Gobierno Vasco.

Table 2. Ideal times for the application of chemical treatment, taken from Department for the Environment and Territorial Policy of the Basque Government (2014)

Phenology	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Active growing												
Flowering												
S*												
Foliar spraying												
Application on stump												
Application after branch cutting												
Injection												

*Seed dispersal.

Fig. 2 Manual removal of young plants in Urdaibai (Northern Spain) (LIFE+ project Estuaries of the Basque Country – LIFE08NAT/E/0055). © Gobierno Vasco.

be applied to large infestations where *B. halimifolia* has reached the mature stage. It is best done when the soil is relatively moist which facilitates removal of the plant, provided care is taken to shake off the soil remaining on the roots to minimize soil loss. It is recommended to carry out periodic pull-ups of young specimens to ensure the effectiveness of the control actions. To minimize seed rain, the elimination of female specimens before the dispersal season (September) should be prioritized, both in the most heavily invaded areas and in nearby areas where isolated specimens appear (Department for the Environment and Territorial Policy of the Basque Government, 2014).

Cutting and uprooting can control the plant locally, but these expensive measures have to be repeated every 2–3 years because of the resprouting ability of the species and its large seed bank. Large plants should be dug out or cut off more than 10 cm below ground level. If plants are removed manually, the roots should be cut well below the soil surface to prevent resprouting. The uprooting can also be done using heavy machinery, though due to the impacts on the environment such a method should rather be used in areas of low conservation value (Department for the Environment and Territorial Policy of the Basque Government, 2014). When uprooting is not possible, regular cutting of the shrubs before they set seed can stop the spread of the plant (Charpentier *et al.*, 2006). Clearing can be done in heavily infested sites. Removed plants should be collected and incinerated to avoid any risk of regrowth from this material (Commission syndicale de grande Brière Mottière, 2007). They also can be piled up, placing the roots upwards to prevent contact with soil and water.

Manual or mechanical stumping of large individuals (more than 1.5 m high) are efficient measures which have a limited impact on the ecosystem but which require good accessibility and follow-up control of any remaining roots (Charpentier *et al.*, 2006).

Cutting large individuals may have varying impacts on the ecosystem. Cutting needs to be repeated several times. Plants regrow vigorously after having been subjected to cutting, and more than 10 stems may regrow instead of 3 or 4 (Commission syndicale de grande Brière Mottière, 2007). Gann *et al.* (2012) reported that cutting *B. halimifolia* for 2 years, where cutting was conducted once in the dormant-season and once in the growing season in each year, resulted in 57% and 74% mortality, respectively. Mechanical control undertaken during the dormant season is

therefore more effective. Such measures should be repeated every 2–3 years as the plant forms new growth (Commission internationale de suivi et d'échange d'expériences, 2011).

Pruning of the aerial part of the plant to 50 cm above ground height can be followed by covering of the tree base with a polyethylene geotextile or black polyethylene plastic (400 gauge) maintained with ropes. Stumps should not have sharp edges as these could pierce the cover and the cover would have to be maintained for a long period of time with controls to ensure there are no cracks in the cover or to eliminate re-sprouts (Commission internationale de suivi et d'échange d'expériences, 2011; Department for the Environment and Territorial Policy of the Basque Government, 2014) (see Fig. 3). This method is nevertheless considered to have a medium efficiency, although it is expensive.

Temporary and permanent flooding with salt or fresh water eliminates the shrub but also affects non-target species and needs to be undertaken over various months. Such a method may not be recommended in protected habitats as it totally modifies the existing habitat (Gobierno Vasco, 2014b) (see Fig. 4). In Urdaibai, Spain, such a method was effective because, although *B. halimifolia* still sprouted in the flooded areas, dense colonization of the area with *Phragmites australis* (Poaceae) could be observed (Department for the Environment and Territorial Policy of the Basque Government, 2014). When immersion in fresh water is less efficient (Commission syndicale de grande Brière Mottière, 2007).

After any intervention, the soil should not be left bare, and pasture or crop seeds should be sown to compete with new plants germinating from the *B. halimifolia* seed bank.

The ideal times for application of manual and mechanical measures are shown in Table 3 and Table 4 shows the effectiveness of control measures according to the size of a population.

Fig. 3 Eradication of an area of *B. halimifolia* with black plastic in the Basque Country (Proyecto Life, 2010).

Fig. 4 Permanent flooding in a previously invaded area in Urdaibai, Northern Spain. © Estela Beteta.

4. Verification of pest eradication

Chemical or mechanical measures should be conducted until no sign of *B. halimifolia* is found. The seed bank is expected to persist for at least 2 years (Panetta, 1979a). Preventive measures in infested fields are therefore recommended for at least this long.

Appendix 2 – Containment programme

Eradication of an established population is difficult. Containment measures aiming to prevent further spread of the pest to endangered areas or to neighbouring countries should be applied.

Surveillance

See point 1 in Appendix 1.

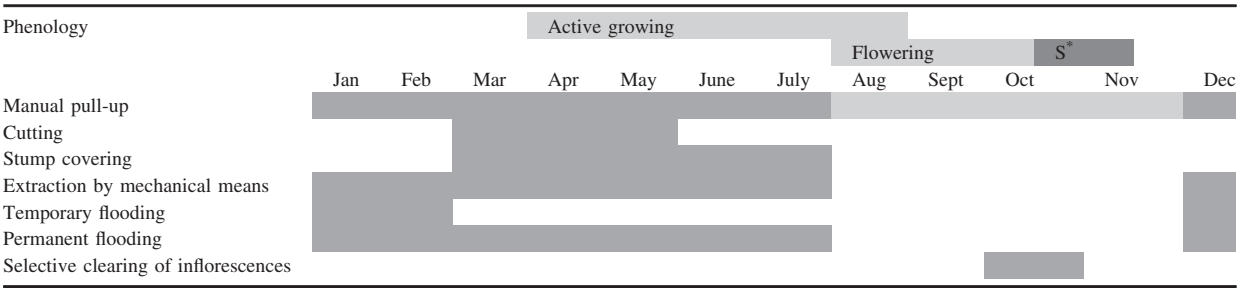
Containment measures

Containment measures regarding the prevention of natural spread or through the movement of soil, machinery or any contaminated commodity should be applied (see point 2 in Appendix 1).

Integrated cultural control

Overgrazing and drainage which convert salt marshes into shrublands favour the establishment and spread of *B. halimifolia*. The maintenance of a dense cover where possible may effectively shade the surface of the ground, creating less favourable conditions for the development of *B. halimifolia* (CABI, undated). Indeed, during early development (before the 5-leaf stage), heavy shade can affect root and leaf allocation and root establishment, leading to seedling mortality (Panetta, 1977). However, the critical factor for establishment of *B. halimifolia* will not be the

Table 3. Ideal times for the application of manual and mechanical measures, taken from Department for the Environment and Territorial Policy of the Basque Government (2014)



*Seed dispersal.

Table 4. The effectiveness of control measures according to the size of the population. The potential effectiveness for different sized populations is indicated with a + symbol where a single symbol represents a low effectiveness and three symbols represent a high effectiveness

Method	New incursion (young plants)	Small or medium-sized invasions	Large and widespread invasions	Effectiveness	Comments
Chemical foliar spraying		+++	++	High	Unintentional effect on non-target plants
Chemical application on stump		+++	++	High	Very effective but expensive and requires trained personnel
Chemical application after cutting		+++	++	High	Very effective but expensive and requires trained personnel
Chemical injection		+		High	Suitable for specimens near water
Manual pull-up	+++			High	Low impact on the ecosystem
Cutting	++	+		Low/medium	Expensive measures, impacts of uprooting, therefore only in low conservation value habitats
Stump covering		+		Medium	Expensive for large populations
Extraction by mechanical means		+++	++	High	Can have an initial negative impact on the environment due to the use of machinery
Temporary flooding			++	Medium	Also affects non-target species and temporarily modifies the environment
Permanent flooding			++	Medium	Also affects non-target species and permanently modifies the environment
Selective clearing of inflorescences		++	+		Expensive and requires repeated measures
Pruning		++	+	Medium	Expensive and requires repeated measures

available light but rather drought and/or a lack of nutrients resulting from competition with established plants.

Grazing of sheep and goats can reduce the spread of *B. halimifolia* locally when there is a heavy pasture load. This is therefore only possible in an intensive production system. Otherwise this method is not very efficient as the species has a low palatability and trampling may enhance germination of *B. halimifolia* from the seed bank (Muller, 2004; Charpentier *et al.*, 2006).

In non-grazing situations, and where species of conservation value are not related to open habitats, reforestation could help in controlling *B. halimifolia* (CABI, undated). Additional control measures such as chemical treatment or manual removal will be necessary (Commission internationale de suivi et d'échange d'expériences, 2011).

Temporary or permanent flooding with marine water could limit the spread of the species, but needs to last several months. This method is therefore not recommended in protected habitats (Gobierno Vasco, 2014b) (see Appendix 1).

Control through fire has proven to be inefficient or even counterproductive and is not considered to be an option (Muller, 2004). *Baccharis halimifolia* resprouts after fire and the clearing enhances germination from the seed bank, which requires complementary measures if it is to be managed (Charpentier *et al.*, 2006). In Cantabria, after a prescribed fire, *B. halimifolia* re-sprouted in 100% of cases (Department for the Environment and Territorial Policy of the Basque Government, 2014). It may be an option to open an area which is highly invaded to allow grasses to establish more quickly and outcompete *B. halimifolia*, but complementary management measures are necessary (Commission syndicale de grande Brière Mottière, 2007).

Any control measures undertaken should be followed by habitat restoration so that the habitat can keep the density of *B. halimifolia* low.

Where budget is very limited, or in large infested areas, it is recommended to at least cut off the female inflorescences before seed dispersal to avoid spread of the species. Further treatments will be needed since this method does not eliminate the plant (Gobierno Vasco, 2014b).

Biological management

Maintaining the ecosystem in good condition represents in itself a preventive management measure, since the resilience of ecosystems is the first barrier to halt the introduction of any invasive alien species. The land should therefore be managed to maintain healthy native communities. Disturbance of vegetation in uninvaded areas should be minimized to avoid creating environmental conditions that favour germination and subsequent establishment of *B. halimifolia* (Department for the Environment and Territorial Policy of the Basque Government, 2014). Promoting competition by good pasture management, reforestation (which requires previous clearing) and the planting of native species may prevent the establishment or re-sprouting of *B. halimifolia*.

Several biological control agents have been tested, but are not regarded as highly efficient. In Australia, biological control programmes started in 1967. Over 35 different insects were tested, but only 6 became permanently established in the field: *Aristotelia ivae* (Lepidoptera: Gelechiidae), *Bucculatrix ivell a* (Lepidoptera: Bucculatrigidae), *Hellinsia balanotes* (Lepidoptera: Pterophoridae), *Megacyllene mellyi* (Coleoptera: Cerambycidae), *Rhopalomyia californica* (Diptera: Cecidomyiidae) and *Trirhabda baccharidis* (Coleoptera: Chrysomelidae). In addition, *Puccinia evadens* (Basidiomycota: Pucciniaceae) was released in Australia in 1998 and is now well established (Palmer *et al.*, 2010; Queensland Government, 2013).

In France, two soft scales have been identified on *B. halimifolia* (Fried *et al.*, 2013): *Saissetia oleae* (Hemiptera: Coccidae) and *Ceroplastes sinensis* (Hemiptera: Coccidae), the latter with some impacts on the reproductive rate or even the survival of young plants. Although their use as biological control agents would not be possible (pests of cultivated plants), some discussions were initiated about favouring their spread in nature reserves infested by *B. halimifolia* where they are already present (CEN Languedoc-Roussillon).

Disposal

Plant waste generated in the elimination works should be piled up, and contact with water and with the ground should be avoided. Before collection, the material should be chopped up with hand machinery in order to reduce the volume of material. If the waste has inflorescences, they should be piled at the bottom to prevent seed dispersal by wind. It is not recommended to collect and leave in the environment material containing herbicide residues. If necessary, waste can be removed in large sacks.

After stocking up the waste, authorized burning can be performed, ensuring that no seeds are present as they could be spread by the hot air. The waste could also be burned in an incinerator, but this is very expensive. Alternatively it could also be removed to an authorized landfill. The waste should not be used as compost (Department for the Environment and Territorial Policy of the Basque Government, 2014).