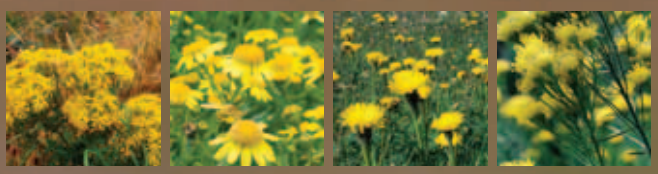
The Scottish Government

The Scottish Government Guidance on

HOW TO PREVENT THE SPREAD OF RAGWORT



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HOW TO PREVENT THE SPREAD OF RAGWORT

Edinburgh 2008

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Contents

Introduction

The aim of this guidance is to prevent and control the spread of ragwort where there is a threat to the health and welfare of animals. Particular emphasis has been placed on protecting horses whose digestive system makes them particularly vulnerable. The Guidance provides comprehensive information on when, where and how to control ragwort, but pays specific attention to the needs of the environment and the countryside as part of the process. The Guidance should benefit the environment by ensuring there is less damage to non-target species, by setting out clear parameters on when it is necessary to control ragwort and by recommending the use of non-chemical options for control where feasible.

Ragwort poisoning can be fatal in horses, as well as being damaging to other livestock. Ingestion of Common Ragwort *Senecio jacobaea* either in its green or dried state, can cause serious liver damage, which can have tragic consequences for both animals and owners. Signs that a horse has been poisoned by ragwort are distressing and include haemorrhage, weight loss, loss of co-ordination, depression, seizures and coma. A horse suffering from ragwort poisoning will be very sick and may be blind and disoriented. Common Ragwort is the only one of the five weeds covered by the Weeds Act 1959, which is harmful to equines and other animals. However, in the right environment, and where there is no risk to animal welfare, ragwort contributes to the biodiversity of the flora and fauna in our countryside. A detailed study of vegetation change published in 2006 shows that the distribution of ragwort has not significantly changed over the last 20 years.

Section 38 of the Animal Health and Welfare (Scotland) Act 2006 (the Act) gives the Scottish Ministers the power to issue such guidance as they consider appropriate, with a view to securing the welfare of protected animals. An animal is a protected animal if it is of a kind which is commonly domesticated in the British Islands, under the control of man on a permanent or temporary basis, or not living in a wild state. This Guidance has been prepared to promote good practice and good neighbourliness, and aims to reduce significantly the risk of horses and livestock being poisoned. It is intended for use by all owners of horses and livestock; landowners and occupiers. It will be particularly relevant for large scale organisations managing significant land areas, including local authorities and public bodies.

The Guidance provides comprehensive information on how to develop a strategic and cost-effective approach to weed control. It gives advice on:

- Identification of Common Ragwort
- Risk assessment and priorities for ragwort control
- Control methods – their suitability and efficacy
- Environmental considerations
- Health and safety issues

The Scottish Government would urge all landowners and land managers to work with horse and livestock owners to adopt the recommendations of this Guidance.

How to Prevent the Spread of Ragwort

Scope

1 This guidance applies to Common Ragwort (*Senecio jacobaea*) and all subsequent references to "ragwort" in this guidance refer to "Common Ragwort" unless otherwise specified. This guidance applies to Scotland only (although separate guidance/codes are available in England and Wales).

Aim

2 The guidance aims to define the situations in which there is a likelihood of ragwort spreading to neighbouring land where it will then present an identifiable risk of ingestions by vulnerable animals, and to provide guidance on the most appropriate means of control, taking into account both animal welfare and environmental considerations.

Introduction

3 Ragwort is a native species of the British Isles. It is a specified weed under the Weeds Act 1959. It contains Pyrrolizidine Alkaloids (PAs) which are highly toxic to a range of animals including horses and cattle. It can contain nine or ten different PAs which are metabolised in the liver of animals consuming ragwort, leading to severe liver damage and often death. Chronic ragwort poisoning is most common as the effects of the PAs build up in the liver over time and can often take weeks or even months for symptoms to become visible. However, poisoning can also be acute. This occurs when an animal consumes a large quantity of ragwort in a short space of time, causing death in a matter of days. Once withered as in hay or in silage, horses and cattle cannot distinguish ragwort as it loses its bitter taste, although it retains its toxicity. In silage bales PAs can diffuse out of ragwort and affect the entire mass of silage; thus a single plant in a bale of silage can be enough to poison several animals (SAC, 2005). Ragwort may also be harmful to humans, particularly where toxic plant juices on hands can contaminate food and snacks; or through direct contact via hand pulling (research on this is however, limited therefore the risk is theoretical). Research undertaken for the UK Government in the 1990s suggested that the risk to human health in the UK through the contamination of staple foods, i.e. grain, milk, eggs and honey, is likely to be insignificant.

4 This guidance does not seek to eradicate ragwort. Ragwort, as a native plant is very important for wildlife in the UK. It supports many species of wildlife, including Common Broomrape (Orobanche minor), 14 species of fungi and many different invertebrates, such as moth caterpillars, thrips, plant bugs, flies, beetles and mites. With the decline in flowering plant diversity in the countryside, ragwort has assumed an increasing importance as a source of food for generalist nectar feeding insects in the late summer. Ragwort is the food plant of at least 77 species of foliage eating insects, including five "Red Data Book" and eight "nationally scarce" species. The most well-known is the cinnabar moth (Tyria jacobaeae). At least 30 species of insects are confined to ragwort, the great majority of which are confined to Common Ragwort or the closely related Hoary Ragwort (Senecio erucifolius). Many species of insects may be seen on ragwort flowers. Some use them as territory markers or as vantage points to find passing prey or mates. Some species prey on the other insect visitors to the flowers, some are more closely associated with the ragwort

flowers, taking ragwort pollen, and more than 170 species have been recorded feeding on ragwort nectar. Such an important source of insects is exploited by birds and mammals. In many situations ragwort poses no threat to horses and other livestock. It is a natural component of many types of unimproved grassland and is used by some invertebrate species that have conservation needs. However, it is necessary to prevent its spread where it presents a high risk of poisoning horses and livestock or spreading to fields used for the production of forage. A control policy should be put in place where a high and medium risk is identified (**see paragraph 13**).

5 Ragwort is normally a biennial plant, present as a rosette close to the ground in Spring of its first year then growing upwards and flowering during Summer of its second year. However, cutting or topping ragwort may alter the plant's lifecycle and result in it being present as a perennial. It is a highly successful species and in certain situations it can be difficult to control, particularly where it has not been effectively managed for a number of years. As a result it might be necessary to use a variety of control methods over an extended period to reduce populations if, on the basis of the risk assessment, they have been found to be problematic.

Legal framework

6 Under the Weeds Act 1959 the Scottish Ministers, if satisfied that injurious weeds are growing upon any land, serve a notice requiring the occupier to take action to prevent the spread of those weeds. An unreasonable failure to comply with a notice is an offence. The Weeds Act applies to[1]:

- Common Ragwort (*Senecio jacobaea*)
- Spear Thistle (*Cirsium vulgare*)
- Creeping or Field Thistle (*Cirisium arvense*)
- Curled Dock (*Rumex crispus*)
- Broad-Leaved Dock (*Rumex obtusifolius*)

The Rural Payments and Inspections Directorate of The Scottish Government gives priority to investigating complaints where there is a risk of weeds spreading to land used for grazing horses or livestock, land used for forage production and other agricultural activities.

7 The provisions of the Weeds Act do not apply to other ragwort species. Other species of ragwort may be equally toxic to horses or other livestock, but are less common or relatively rare. In some situations they may need to be controlled. Some species, such as Fen Ragwort, are protected. It is important to make correct identification of ragwort before considering any control measures. Where ragwort is identified on land protected through environmental or ecological designation or by means of other land management agreements, the required obligations and restrictions must also be fully considered and discussed with the appropriate authorities (**see appendix 4**) before control action is initiated.

8 Section 38 of the Act gives the Scottish Ministers the powers to issue such guidance as they consider appropriate, with a view to securing the welfare of protected animals.

1 The Scottish Ministers are empowered to add to this list if necessary

Responsibility to control the spread of ragwort

9 Responsibility for control rests with the occupier of the land on which ragwort is growing. This responsibility applies to ragwort and the other weeds specified under the Weeds Act. When seeking to prevent the spread of ragwort in any particular area it is expected that all adjacent landowners, occupiers and managers will co-operate and, where necessary, take a collective responsibility for ensuring that effective control of the spread of ragwort is achieved. Where it is impossible to obtain co-operation the issue should be referred to the local Scottish Government Rural Payments and Inspections Directorate Area Office.

10 The most effective way to prevent the spread of ragwort is to preclude its establishment through strategic management rather than last-minute control. In managed grasslands good agricultural management will minimise the chance of ragwort establishing itself. In amenity areas, road verges, railway land and woodland; any activities which cause disturbance to the soil and the loss of ground cover may increase the risk of ragwort becoming established.

11 Occupiers of all land, including uncultivated land, derelict areas and waste ground, should be vigilant for the presence of ragwort. A notice under the Weeds Act 1959 can be served on landowners or land occupiers requiring them to control infestations of ragwort to prevent them spreading. Particular vigilance is required where ragwort poses a high risk to land used for grazing or forage production. Detection at an early stage will enable any potential problems to be more easily, safely and economically dealt with. The implementation of a control strategy will ensure that persistent problems are dealt with in a timely manner.

Assessing the risk posed by ragwort

12 Where land is affected by ragwort the owner/occupier should make an assessment to determine whether action should be taken to prevent the spread of ragwort to neighbouring land by establishing the risk posed to grazing animals or forage production.

13 The following three risk categories are provided as *guidelines* for assessing risk:

High Risk:

- Ragwort is present and flowering/seeding within 50m of land used for grazing by horses or other animals or land used for feed/forage production

Medium Risk:

- Ragwort is present within 50m to 100m of land used for grazing by horses or other animals or land used for feed/forage production

Low Risk:

- Ragwort or the land on which it is present is more than 100m from land used for grazing by horses or other animals or land used for feed/forage production

The distances given above are guidelines *only* and when assessing risk, account should also be taken of particular local circumstances and other relevant factors such as prevailing winds, shelter belts and natural barriers. Whether or not the density of ragwort is high

or low, the risk factor will be determined by the likelihood of it spreading to land used for grazing and/or feed/forage production.

Action to be taken by owners of livestock

14 Livestock owners are responsible for the welfare of their animals and they should satisfy themselves that their stock is not exposed to the risk of ragwort poisoning. In particular they should:

- ensure pastures are maintained in good condition and are not under or over grazed (**see appendix 1**)
- inspect grazing land regularly for ragwort (**see appendix 2**) when animals are present
- move stock to ragwort free land where practicable, taking into account the experience of stockmen on the likelihood that particular animals will ingest ragwort (**see paragraph 6, appendix 4**)
- remove ragwort plants, where necessary, using an appropriate control technique (**see appendix 3**) taking account of the status of the land (**see appendix 4**)
- dispose of ragwort plants in an approved manner (**see appendix 5**)
- follow safety guidelines (**see appendix 6**)

Action to be taken by producers of conserved forage

15 Producers of conserved forage should:

- ensure managed grassland is maintained in good condition (**see appendix 1**)
- inspect land regularly for ragwort (**see appendix 2**) in the growing season
- remove ragwort plants using an appropriate control technique (**see appendix 3**) taking account of the status of the land (**see appendix 4**)
- dispose of ragwort plants in an approved manner (**see appendix 5**)
- follow safety guidelines (**see appendix 6**)

Action to be taken by other owners/occupiers of land

16 Owners/Occupiers should:

- identify land on which ragwort (**see appendix 2**) is present
- notify neighbouring land occupiers where there is risk of ragwort poisoning
- review the risk of spread to land used for grazing or conserved forage production (**see paragraph 11**) on a six-monthly basis
- ensure managed grassland is maintained in a good condition (**see appendix 1**)
- where appropriate and safe to do so avoid removing ground cover in amenity areas, roadside verges and on railway land unless provisions are made for the appearance of ragwort
- pay particular attention to areas of bare/disturbed land
- where a **high risk** is identified:
  – take **immediate** action to control the spread of ragwort using an appropriate control technique (**see appendix 3**) taking account of the status of the land (**see appendix 4**)

- where a **medium risk** is identified:
  – establish a control policy to ensure that where a change from a medium to a high risk of spread can be anticipated, it is identified and dealt with in a timely and effective manner using appropriate control techniques (**see appendix 3**) taking account of the status of the land (**see appendix 4**)
- where a **low risk** is identified:
  – no immediate action is required (**see paragraph 21**)
- cleared ragwort plants should be disposed of in an approved manner (**see appendix 5**)
- follow safety guidelines (**see appendix 6**)
- regularly monitor the impact of control action to ensure its effectiveness for up to six months or to the end of the growing season if sooner

Control methods

17 A summary of possible control methods are shown at Table 1 (overleaf). In most cases a single control method or single application will not be completely effective and consideration should therefore be given to combining more than one control/management technique. Effective control might not be achieved in one season, particularly where there is a dense infestation that has been inappropriately managed in the past. The cost categories shown in the table do not provide a reliable guide to costs where linear land such as roads and railways is concerned. Control techniques are considered in more detail at Appendix 3.

Control policies

18 Where a medium or high risk has been identified, owners/occupiers and managers of land (including private and public land, roads, waterways, railways, conservation and amenity areas and land awaiting development), should put in place and implement a ragwort control policy. Such policies should take account of the need for vegetation management, including weed control and identify ragwort as a specific weed that should be controlled. The nature conservation status and biodiversity attributes of the land, and the contribution to them made by the ragwort, must also be considered when determining a policy.

19 When considering what is practical, owners/occupiers/managers should balance the risk against the time and cost of taking the action, and consider whether the cost of control is proportionate to that risk. For some categories of land, e.g. railway land and trunk roads, the size and nature of the estate makes frequent inspections difficult. However, the relevant area managers should be encouraged to build up records of ragwort outbreaks using information gathered from site inspections, ad-hoc visits and public observations; to help formulate a strategy for targeted action with the initial focus on ragwort 'hot-spots' where the potential risk posed to grazing animals or forage production is assessed as being high. Where ragwort is present in areas that will cause a high risk (**see paragraph 13**) during the flowering/seeding season, or a medium risk anticipated to become a high risk, there should be a presumption that action to manage the spread of ragwort will be necessary, even where the cost of control is potentially high.

20 A control policy should encourage collaboration and co-operation with neighbours to achieve effective control of the spread of ragwort. Wherever practicable control action

Table 1. Summary of control methods

Method	Labour requirement	Cost	Prevention of flowering	Success of control – long term	Grazing removal period (days)	Number of treatments required per year	Repeat time scale (years)	Optimum time of treatment	Suitable for large areas	Suitable for dense ragwort colonisations	Remarks
Cutting	*	*	**	*	0(1)	1/2	1	F	***	***	Emergency treatment to prevent seeding. It is essential to cut before seed heads are mature & must be followed with a control technique
Levering out	***	*	***	**	0(1)	1/2	1	F	*	*	Tools available for digging up plants. Best results when soil is wet. Very dependent on spotting plants, some may be missed requiring further treatment.
Herbicide citronella oil derived product (3)	***	***	***	***	7(2)	1-2	1	R And F	*	*	Very dependent on spotting plants, resulting in some being missed. Large plants may need respraying two weeks later. Will control broad-leaved plants.
Herbicide selective spraying (3)	*	**	***	***	21(2)	1-2	1	R	***	***	Most products will kill other broad-leaved plants sprayed.
Herbicide spot treatment (3)	***	**	***	***	21(2)	1-2	1	R Or F	***	*	Very dependent on spotting plants, some may be missed requiring further treatment.
Herbicide weed wipes	*	**	**	**	21(2)	1-2	1	F	***	***	Only tall ragwort plants will be effected.
Pulling by hand	***	*	***	**	0(1)	1-2	1	F	**	*	Gloves must be worn. Best results when soil is wet. Very dependent on spotting plants, some may be missed requiring further treatment.
Pulling by machine	*	**	***	**	0(1)	1	1	F	***	***	Selects plants for pulling on height difference & leaves shorter plants.
Biological	*	***	*	?	N.B. Not suitable as a method of control on grazing land	1	1	R Or F	***	***	Biological control using the Cinnabar Moth is at the early stages of development in the UK.

Key: * Low ** Medium *** High: R – When rosettes start growing; F – early summer before flower heads mature; (1) – Provided ragwort cuttings are removed; (2) These timings are only a guide – follow the manufacturer's guidelines; (3) Always follow the manufacturer's guidelines.

For further advice on grazing removal periods, refer to paragraph 24 and 25 of Appendix 3.

For a list of suitably qualified spray contractors, contact the National Association of Agricultural Contractors (NAAC). See Appendix 9 for details.

should be taken at early stages of growth in order to reduce the risk of seed dispersal and thereby achieve more effective long-term control.

21 Where a low risk is identified (**see paragraph 13**) but the presence of ragwort is likely to present a risk in the future, contingency plans should be prepared for its control. Where there is no immediate risk the presence of ragwort should be recorded and the situation should be monitored six monthly to ensure that the risk is reassessed should circumstances change.

Local control strategies

22 At local levels, it may be useful for those responsible for the management of the land or adjacent land, and those with a statutory or advisory remit for nature conservation and animal welfare, to get together to form a Local Ragwort Strategy Group. These groups may be particularly effective in areas where there is a conservation and wildlife interest and where ragwort management is a difficult issue. As well as considering the wider biodiversity interests being sustained by the ragwort, attention will need to be given to maintaining populations of native fauna which feed on the plant and which may assist in the control process. Such groups could agree a way forward on ragwort control which would be endorsed by all parties.

Advice

23 The Scottish Government and UK Government have produced a range of guidance on the Weeds Act, which is listed in Appendix 8. Technical advice and advice on ragwort control is also available from the organisations listed at Appendix 9.

24 Advice may also be available from organisations which are responsible for the management of land in their ownership and/or control, e.g. Transport Scotland, Local Authorities, Network Rail, British Waterways Scotland, Scottish Natural Heritage, the National Trust for Scotland, Forestry Commission Scotland and Ministry of Defence etc. (**see appendix 7**).

Enforcement

25 The Rural Payments and Inspections Directorate can take enforcement action under the Weeds Act where ragwort poses a high risk to horses, livestock, the production of conserved forage or other agricultural activities. Where a potential problem is identified contact should first be made with the owner/occupier or relevant body responsible for the land on which the ragwort is growing to attempt to resolve the matter informally, before contacting the Rural Payments and Inspections Directorate. Organisations that control or own land are listed in Table 2.

Table 2 - Organisations that own and/or control land

Location	Owner/Occupier
Private & commercial property & land & private roads	Owner/Occupier
Agricultural land & land used for livestock other than animals kept for non-agricultural business or recreational purposes	Owner/Occupier
Motorways & trunk roads	Transport Scotland
All other public roads	Local Roads Authority
Railway land	Network Rail
Canals & Towpaths	British Waterways Scotland
Site of Special Scientific Interest (SSSI)	Scottish Natural Heritage/Owner/Occupier
National Nature Reserves/Natura 2000	Scottish Natural Heritage/Owner/Occupier
Local Nature Reserves	Local Authority/Occupier
Common Areas/Common land	Local Authority/Owner
Ministry of Defence land	MoD
Development land	Owner/Occupier
Local Authority land	Local Authority
Private Woodland/Forestry	Owner/Occupier
Forestry (Forestry Commission Scotland)	Forestry Commission Scotland

26 Where, having been requested to do so, the owner/occupier/relevant body fails to take any action to prevent the spread of ragwort or fails to demonstrate compliance with this Guidance, the Rural Payments and Inspections Directorate should be notified (**see appendix 7**).

GRASSLAND MANAGEMENT Appendix 1

Pastures

1 Pasture management plays a crucial role in preventing the establishment and spread of ragwort. It is not possible in guidance of this nature to provide comprehensive information on pasture management. Best practice varies according to specific circumstances, e.g. in relation to managed grassland or unimproved semi-natural grassland.

2 Horses are very selective grazers and will eat down some areas until they are almost bare. Coarser grasses can dominate, particularly in those areas where horses dung or urinate, and the grass is left to seed creating a very uneven sward. Bare patches can develop resulting in ideal conditions for the establishment of ragwort. Horse pastures in particular must be very carefully managed to prevent this. Leaving horses out in wet winter conditions can exacerbate the situation causing the ground to become poached (i.e. churning up of land by animals), damaging the grass sward and providing an opportunity for ragwort to establish in the bare ground.

3 To maintain horse pasture in good condition:

- stocking densities should be appropriate to the size of grazing area and available herbage
- dung should be collected and removed or spread regularly
- plants poisonous to livestock should not be allowed to proliferate
- prevent poaching by keeping horses off fields in wet conditions, wherever practicable and maintain drainage
- remove any stale, dry fodder such as hay

4 Agriculturally improved grassland should be managed to achieve a dense ground cover of grasses.

- Nutrient and pH levels should be maintained through the appropriate application of fertilisers and lime (application rates should be determined by a soil analysis)
- Appropriate stocking levels should be maintained to avoid under and overgrazing
- Where pastures deteriorate to such an extent that other methods do little to improve the sward cover, renovation through reseeding may be necessary
- Poaching should be minimised to prevent sward damage

5 Where grassland is being managed for its ecological value, but is also being used for grazing, different constraints will apply. Here it will be necessary to keep the population of weeds designated under the Weeds Act to a minimum level consistent with the ecological requirements of the site, the species of conservation significance living there, and the welfare of the grazing animals.

Semi-natural and uncultivated areas

6 Wherever possible uncultivated land with low levels of ragwort should remain undisturbed. Where an open sward is maintained and ragwort can be expected to be a natural component of grassland, other control methods might be necessary to prevent ragwort becoming a problem.

7 Anyone intending to use uncultivated or semi-natural land[2] for intensive farming purposes[3] must first obtain a screening decision on the proposal from the Scottish Ministers under provisions of the Environmental Impact Assessment (Agriculture) (Scotland) Regulations 2006. Similarly, you must obtain a screening decision for projects involving the restructuring of rural land holdings on agricultural land[4] to be carried out in a sensitive area (as defined by the Regulations), or which exceeds the threshold applicable to the project determined by the regulations. The screening decision determines whether the project is likely to be one that has significant effect on the environment and, if so, the requirement for the applicant to include an environmental statement in the application to the Scottish Ministers for consent for the project. Information, guidance and other documents can be found at The Scottish Government web-site http://www.scotland.gov.uk/topics/agriculture/environment/16808/7217. Further information and technical advice can be obtained from the local Rural Payments and Inspections Directorate Area or Sub-Area Offices (**see appendix 7**).

2 For example: unimproved grassland, heath and moorland, or scrubland and wetlands
3 This includes cultivation, drainage works. Increased applications of fertilisers, etc.
4 Examples of restructuring projects may include amalgamating or splitting of field boundaries, drainage works, land reclamation, modification of watercourses, re-contouring etc.

BIOLOGY AND IDENTIFICATION Appendix 2

Introduction

1 Common Ragwort (*Senecio jacobaea*) is an erect plant usually 30-90cm high, but may exceed 100cm. The stems are tough and often tinged red near the base, but brighter green and branched above the middle. A basal rosette of leaves usually dies before flowering but the stem leaves persist. They are deeply dissected, with irregular, jagged-edged lobes. All the leaves are dark green and rather tough and may be sparsely hairy on the lower side. The inflorescence is a conspicuous, large, flat-topped head of densely packed yellow flowers with ray florets and disc florets, all of which are bright yellow. The seeds are borne singly and have a downy appendage making them readily dispersible. Once in the soil seeds can lie dormant for several years before germinating.

Biology

2 Common Ragwort is normally biennial (rosette 1st year and flowering 2nd year). During its first year of growth it establishes a rosette of basal leaves and over winters in this way. During the second year the rosette sends up one or more leafy stem, up to one metre in height, which is unbranched and produces numerous flower heads at the top. The flower heads are carried in a large flat-topped cluster. Flowering usually occurs from June until late October after which the plant dies.

3 Common Ragwort can also behave as perennial (flowering every year) after damage to the crown such as cutting, grazing, hoof damage, damage by machinery and following incomplete/ineffective hand pulling in dry weather. It can also remain in the rosette stage for several years under intensive cutting regimes such as may be practised on amenity grassland.

Distribution

4 Common Ragwort is widespread throughout the UK and can be found on wasteland, development land, roadside verges, railway land, amenity land, conservation areas, set-aside, woodland and grazing land. Poor quality and poorly managed horse pastures are particularly susceptible to high densities of ragwort.

Habitat

5 Common Ragwort can be found over a large range of soil types and climatic conditions, it can be characteristic of badly managed grasslands, where trampling breaks the sward, where patches of turf have died in drought or where there is over or under grazing. However, well-managed acid/calcareous grasslands may naturally contain ragwort. Disturbance to grass verges, embankments and woodland areas which leads to open soil are also favourable conditions for seedling establishment.

Other Species of Ragwort

6 Whilst only the more frequently found Common Ragwort is subject to the provisions of the Weeds Act, there are other members of the same native species family which can cause some identification problems. Marsh Ragwort (*Senecio aquaticus*) is locally abundant in wet areas of fields, ditch banks and marshes. Hoary Ragwort (*Senecio erucifolius*) occurs mainly on roadsides, semi-natural meadows and field boundaries. Oxford Ragwort (*Senecio squalidus*) grows widely on roadsides, railway land, old walls and unmanaged land.

Marsh Ragwort
Senecio aquaticus

Oxford Ragwort
Senecio squalidus

Horay Ragwort
Senecio erucifolius

Common Ragwort

Common Ragwort look-alike Plants

Field fleawort
Tephroseris integrifolia

Yellow Loosestrife
Lysimachis vulgaris

Tansy
Tananetum vulgare

Goldenrod
Solidago virgaurea

Fleabane
Pulicaria vulgaris

Agrimonies
Agrimonia spp.

St. John's worts
Hypericum spp.

Mulleins
Verbascum spp.

Heath Groundsel
Sencio sylvaticus

Sow Thistles
Sonchus spp.

Hawkweeds
Hieracium spp.

Elecampane
Inula helenium

Hawk's beards
Crepis spp.

Ox's tongues
Picris spp.

Common Ragwort look-alike Plants (continued)

Hawkbits
Leontodon spp.

Goatsbeard
Tragopogon pratensis

Cat's ears
Hypochaeris spp.

Goldilocks aster
Aster linosyris

Rare Ragwort Species

Fen Ragwort
Senecio paludosus

Welsh Groundsel
Senecio cambrensis

York Groundsel
Senecio eboracensis

CONTROL TECHNIQUES Appendix 3

INTRODUCTION

1 Where the risk that ragwort will spread is such that control action is required or where ragwort is present on grazing land/land used for the preparation of conserved forage, three primary control methods are available:

- cultural
- chemical
- biological

Each method can be employed in a number of ways depending on the location, the population density, and the extent of control required. In many cases effective control will only be possible if a combination of methods is employed. Repeat treatment over several seasons might also be required to deal with long established populations of ragwort.

2 The decision tree in Figure 1 will assist with selecting the most appropriate method of control.

3 On managed grassland or other pasture, land management techniques have an important role to play in controlling the spread of ragwort by preventing its establishment (**see appendix 1**).

4 All grazing animals are susceptible to the toxic effects of ragwort and therefore the deliberate control of ragwort by grazing horses, sheep, goats or other livestock must not be undertaken.

CULTURAL CONTROL TECHNIQUES

5 Several cultural methods can be used to prevent the spread of ragwort including the general avoidance of bare ground areas, pulling/levering, cutting, and the use of burners. Figure 2 will assist with selecting the most appropriate method of cultural control.

Figure 1. Decision Tree to Assist Selecting the Most Appropriate Control Method

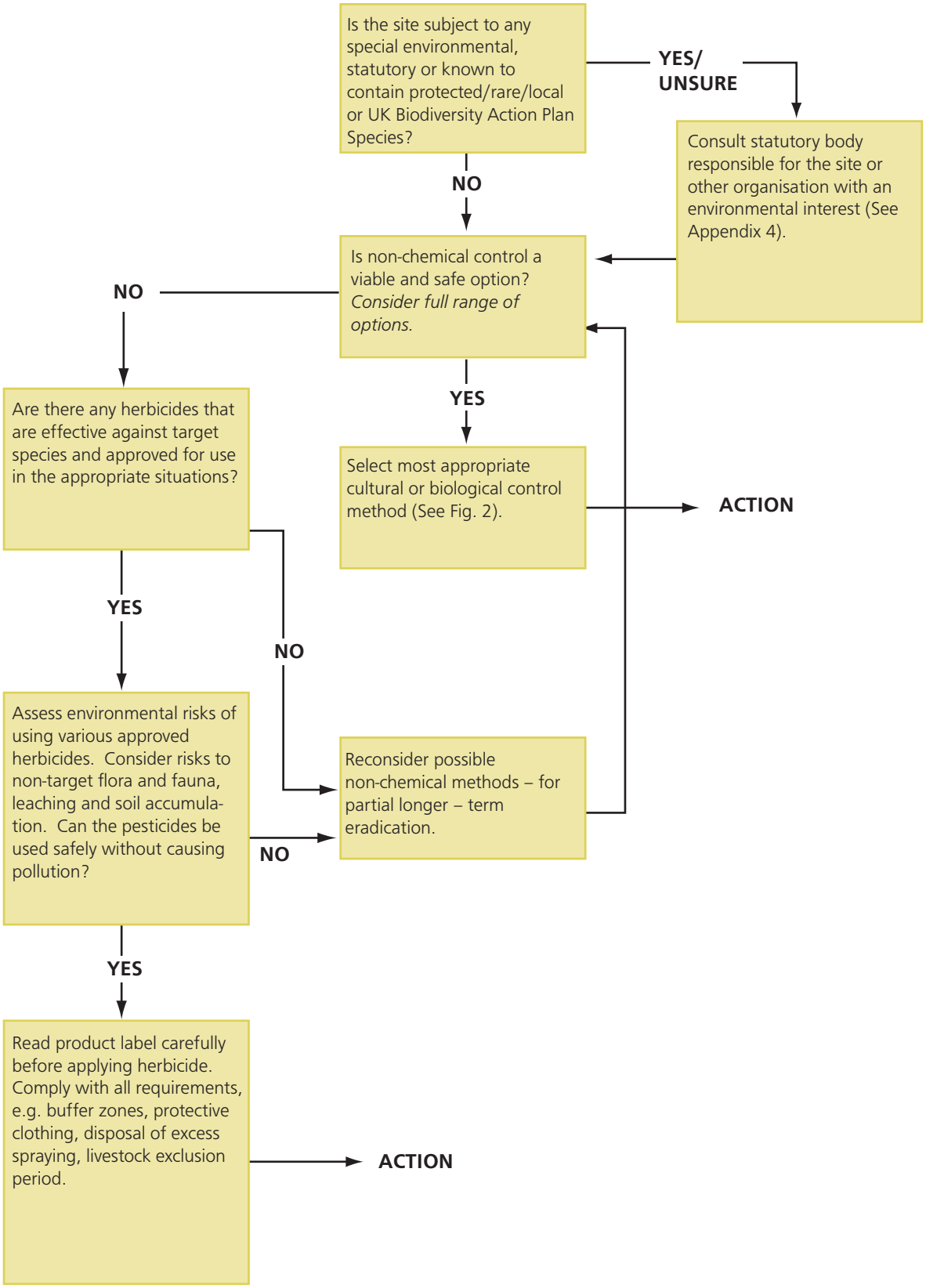

Figure 2. Selecting the Most Appropriate Cultural and Biological Control According to Size of Area and Level of Density of Plants