Scientific name	*Ambrosia artemisiifolia*
Common name	Common ragweed
Broad group	Plant
Number of and countries wherein the species is currently established	19: AT, BE, CZ, DE, DK, ES, FI, FR, HR, HU, IT, LV, NL, PL, RO, SK, SL, SE, UK
Risk Assessment Method	EPPO, GB NNRA
Links	http://www.eppo.int/QUARANTINE/Pest_Risk_Analysis/PRAdocs_plants/08-14124%20PRA-Ambrosia.doc https://www.eppo.int/QUARANTINE/Pest_Risk_Analysis/PRAdocs_plants/99-7775%20repPRA%20Ambrosia%20spp.doc https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=865
1. Description (Taxonomy, invasion history, distribution range (native and introduced), geographic scope, socio-economic benefits)	Socio-economic benefits: *Ambrosia artemisiifolia* may be used for phytoremediation of soils contaminated with heavy metals (Bassett & Crompton, 1975, Kang *et al.*, 1998), as an anti-inflammatory agent (Stubbendieck *et al.*, 1994) and as an antibacterial agent (Kim *et al.*, 1993). *Ambrosia artemisiifolia* is able to successfully remove soil Pb and Cd during repeated croppings; tissue Pb was correlated with exchangeable soil Pb at r2=0.68 in *A. artemisiifolia* (Pichtel *et al.*, 2000).
6. Can broadly assess environmental impact with respect to ecosystem services	*Ambrosia artemisiifolia* may also serve as an alternative host for crop diseases (several species) for example in the CABI compendium: *Meloidogyne arenaria* race 2 (Tedford & Fortnum, 1988), *M. incognita* race 3 (Tedford & Fortnum, 1988), *Erysiphe cichoracearum* (Bassett & Crompton, 1975), *Albugo tragopogonis* (Bassett & Crompton, 1975), *Plasmopara halstedii* (Bassett & Crompton, 1975), *Entyloma compositarum* (Bassett & Crompton, 1975), *Entyloma polysporum* (Bassett & Crompton, 1975), *Puccinia xanthii* (Bassett & Crompton, 1975), Aster yellow virus (Bassett & Crompton, 1975), Cucumber mosaic virus (Kazinczp *et al.*, 2001), *Cuscuta gronovii* (Bassett & Crompton, 1975), *Protomyces gravidus* (Cartwright & Templeton, 1988), *Septoria* sp. (Bohár & Schwarczinger, 1999), *Phoma* sp. (Briere *et al.*, 1995) and *Sclerotinia sclerotiorum* of sunflower (Bohár & Kiss, 1999).

	In summary the main impacts are on food crops. Some impacts on cultural services (recreation and tourism) are possible. All other impacts are indirect and were assessed to be minor. For example, impacts on fuel and fodder crops are expected to be minor because they are usually produced in continuous cover regimes and so do not provide the necessary habitat disturbance required by *A. artemisiifolia*. Further information from GISD (http://www.issg.org/database/welcome/) indicates that *A. artemisiifolia* fruits are a food source for the bobwhite quail but can cause illness in livestock when ingested (USGS-NPWRC, 2006).
8. Includes status (threatened or protected) of species or habitat under threat	There are no reports of significant evidence of adverse effects from *A. artemisiifolia* on biodiversity in Europe (as it occurs in crops, along roads or in disturbed areas) (Bullock *et al.*, 2010). Its occurrence along roads is a result of unintentional spread by human activities of feeding wild animals.
9. Includes possible effects of climate change in the foreseeable future	Future global change may increase the spread and consequently the extent of this species in Europe (Cunze *et al.*, 2013, Dullinger *et al.*, 2009, Essl *et al.*, 2009). Climatic conditions, especially cooler and damp autumn conditions, are considered to be the main reason for *A. artemisiifolia* not establishing in the North of Europe, however in the predicted warmer future climate, establishment seems likely (Rich, 1994). According to climate models, a North-east shift and doubling of the suitable surface area (from 3.47 to 7.10*106km) is predicted (Cunze *et al.*, 2013). Increasing CO_2 concentrations are also likely to influence the negative health impacts of *A. artemisiifolia* (Ziska & Caulfield, 2000). Pollen production in a projected 21st century concentration of CO_2 (600 µmol mol–1) increased by 320% compared to pre-industrial levels of CO_2 (280 µmol mol–1). A 61% increase in pollen production is predicted under a CO_2 rich environment (Wayne *et al.*, 2002). It is anticipated that climate change may exacerbate ragweed allergies by increasing pollen production and extending the pollen season (Bullock *et al.*, 2010). Inclusion of predicted climate change within models slightly increases the economic impacts of ragweed. When management is included in the

	models, the future impacts are reduced. Economic impacts of ragweed in 20 years time with climate change rise slightly (by around 3%) compared to a scenario without climate change. When controls are introduced, there is a significant decrease (over 25%) in the impacts following climate change, as controls limit ragweed, shifting its range to follow its 'climate space' across the study area. Nevertheless, the distribution of is predicted to shift northwards with climate change, with substantial cost increases in some areas (e.g. Germany, France, Poland). Climate and land use change are predicted to have a large impact on the distribution of ragweed in Europe. Models suggest that climate change will permit ragweed to spread into cropland and urban habitats in Northwest Europe, potentially reaching as far north as the southern Baltic coastline by 2050. Depending on the climate and land use change scenario considered, models predict heavy invasion and increased impacts to crops and public health in Germany, Netherlands, Belgium, northeast France, southern UK, Czech Republic, Poland and western Ukraine. Furthermore models also suggest that the population and impacts of ragweed will decline in the current invasion hotspots, because of a combination of excessively high temperatures and potential abandonment of cropland in eastern Europe. We consider this prediction to be less certain than the northward range expansion since ragweed's response to high temperatures is less well-resolved than its response to cold and there is great uncertainty in the land use change scenarios for some countries.
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Notes	Main impacts are on food crops. All other impacts are indirect and were assessed to be minor.
Outcome	Compliant