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## Wild plant species as subjects in O<sub>3</sub> research

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### Abstract

Tropospheric ozone (O<sub>3</sub>) occurs in high concentrations nowadays and affects a many plant species in Northern hemisphere. Numerous wild plant species are known to be negatively affected by O<sub>3</sub>, and this may impact biodiversity and ecosystems in near future. Given the importance of O<sub>3</sub> research with wild plants, we provide a list of 473 relevant taxa - that have been used as a subject of O<sub>3</sub> research - as a research material, under various controlled-environment facilities, along with information about their response to O<sub>3</sub>. In addition, we include species which have been reported that they had developed ozone-like (but not confirmed) symptoms. This list of taxa along with the references is considered an important database, useful to researchers when planning their relevant investigations.

*Key words:* Air pollution, Biodiversity conservation, Genetic resources, Native plants, Natural heritage

### Introduction

Ground-surface ozone (O<sub>3</sub>) is an allotropic form of oxygen and a natural constituent of the atmosphere already known since the Hellenic antiquity (e.g. Saitanis 2008). The tropospheric O<sub>3</sub> column accounts for only 10 % of the vertical O<sub>3</sub> column above the earth surface (Krupa and Manning 1988) and results mainly from complex reactions among volatile organic compounds (VOCs), and NO<sub>y</sub> including nitrogen oxides (NO<sub>x</sub>), under ultraviolet (UV) radiation (Krupa and Manning 1988, Chameides *et al.* 1994, Heo *et al.* 2012, Akritidis *et al.* 2014, Santurtun *et al.* 2015). Furthermore, long-range transport of O<sub>3</sub> accounts for its presence even in previously unpolluted regions (Akimoto 2003, Ganey *et al.* 2008, Kleanthous *et al.* 2014, Akimoto *et al.* 2015).

Since the Industrial Revolution, O<sub>3</sub> levels have been quite highly increased (Chameides *et al.* 1994, Akimoto 2003, Akritidis *et al.* 2014, Santurtun *et al.* 2015) and still continue increasing – especially in many cities - (Sicard *et al.* 2013, Paoletti *et al.* 2014, Dominguez-Lopez *et al.* 2015). Asia faces again nowadays very severe ozone pollution problem (Akimoto 2003, Akimoto *et al.* 2015, Feng *et al.* 2015) and it is predicted that many Asian regions will suffer from even higher levels (Takigawa 2009, Yamaji *et al.* 2008).

Ozone is not only a significant greenhouse gas (Paoletti and Manning 2007) but also a menace to plants (e.g. Saitanis 2008). It penetrates plant tissues through stomata and its deleterious effects force plants to express complex responses (Fiscus *et al.* 2005, Vaultier and Jolivet 2014) which finally lead to reduced yields and net primary productivity (Grantz *et al.* 2006, Feng *et al.* 2008, Emberson *et al.* 2009, Ainsworth *et al.* 2012). Forest tree species and other wild plants have been suffering from elevated O<sub>3</sub> (e.g. Long and Davis,

1991, Bortier *et al.* 2000, Burkey *et al.* 2006, Watanabe *et al.* 2007, Paoletti *et al.* 2008, Black *et al.* 2010, Watanabe *et al.* 2010a, Watanabe *et al.* 2010b, Calatayud *et al.* 2011b, Koike *et al.* 2012, Hoshika *et al.* 2013a, Hoshika *et al.* 2013b, Koike *et al.* 2013, Wang *et al.* 2015). Such an impact to wild plants threatens biodiversity and ecosystems stability and, therefore, O<sub>3</sub> research with such species is needed.

Based on the available scientific literature, we reviewed and provide here a catalog of wild plant species - either documented as sensitive or insensitive to O<sub>3</sub> -, that have been studied for their response to O<sub>3</sub>, as base information and an important scientific tool for future research and resources management (Agathokleous *et al.* 2015). Using 195 original peer-reviewed publications dealing with O<sub>3</sub> effects on wild plant species, we created a list with 473 wild plant taxa (Agathokleous *et al.* 2015) which have been tested for O<sub>3</sub>-induced effects, under various controlled-environment facilities (or techniques) as Table 1. In addition, we have traced and include species which have been reported that had developed ozone-like symptoms, but not confirmed (Table 2). We hope this database will support researchers in their experiments as well as practical land-use planners in their effort to form and develop green areas.

### Acknowledgments

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Table 1. Wild species tested for ozone-induced affected parameters, under various controlled-environment facilities (or techniques). When the damage of a species is confirmed in other articles we also include the non-confirmed articles. The note “Yes” in the “Affected” column indicates that species are affected by ozone, and this is confirmed: at least ozone-induced injury appeared on the leaves, and most of the studies include several other parameters such as physiological, biochemical, etc., with the exception of 2-3 cases where other parameters were altered, even if foliar visible injury did not appear. “No” indicates that plants did not negatively respond to ozone at any of the measured parameters

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Abies</b>					
<i>A. concolor</i> (Gord. & Glend.) Lindl. ex Hildebrand	Pinaceae	Tree	Coniferous	Yes	Treshow and Stewart, 1973
<i>A. religiosa</i> (Kunth.) Schltld. & Cham.	Pinaceae				Alvarez et al. 1998
<b>Acacia</b>					
<i>A. aneura</i> F. Muell. ex Benth	Fabaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>A. baileyana</i> F. Muell.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. brachybotrya</i> Benth.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. calamifolia</i> Sweet. ex Lindl.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. decurrens</i> Willd.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. elata</i> A. Cunn. ex Benth.	Fabaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>A. floribunda</i> Sieb.	Fabaceae	Tree / Shrub	Perennial	No	O'Connor et al. 1975
<i>A. glandulicarpa</i> Reader	Fabaceae	Tree / Shrub	Perennial	No	O'Connor et al. 1975
<i>A. greggii</i> A. Gray.	Fabaceae	Tree / Shrub	Deciduous	No	Temple, 1989
<i>A. howittii</i> F. Muell.	Fabaceae	Tree		Yes	O'Connor et al. 1975
<i>A. longifolia</i> (Andrews) Willd.	Fabaceae	Tree		Yes	O'Connor et al. 1975
<i>A. iteaphylla</i> F. Muell ex Benth.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. jonesii</i> F. Muell. & Maiden.	Fabaceae	Shrub		No	O'Connor et al. 1975
<i>A. melanoxylon</i> R. Br.	Fabaceae	Tree		No	O'Connor et al. 1975
<i>A. microbotrya</i> Benth	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. notabilis</i> F. Muell.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. pendula</i> A. Cunn. ex G.Don.	Fabaceae	Tree		No	O'Connor et al. 1975
<i>A. podalyriaefolia</i> A. Cunn. ex G.Don.	Fabaceae	Tree		Yes	O'Connor et al. 1975
<i>A. pravissima</i> F. Muell. ex Benth.	Fabaceae	Shrub	Evergreen	No	O'Connor et al. 1975
<i>A. prominens</i> A. Cunn. ex G.Don.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. pruinosa</i> A. Cunn. ex Benth.	Fabaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>A. pycnantha</i> Benth.	Fabaceae	Trees		Yes	O'Connor et al. 1975
<i>A. rhetinodes</i> Schlecht.	Fabaceae	Shrub	Evergreen	No	O'Connor et al. 1975
<i>A. saligna</i> (Labill.) H. Wendl.	Fabaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>A. sophorae</i> (Labill.) R. Br.	Fabaceae	Shrub		No	O'Connor et al. 1975
<i>A. trineura</i> F. Muell.	Fabaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>A. triptera</i> Benth.	Fabaceae	Shrub		No	O'Connor et al. 1975
<i>A. vestita</i> Ker-Gawl.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<i>A. wattiana</i> F. Muell. ex Benth.	Fabaceae	Tree / Shrub		No	O'Connor et al. 1975
<b>Acer</b>					

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>A. campestre</i> L.	Sapindaceae	Tree	Deciduous	Yes	Bussotti <i>et al.</i> 2006; Zhang <i>et al.</i> 2001
<i>A. grandidentatum</i> Nutt.	Sapindaceae	Tree	Deciduous	Yes	Treshow and Stewart, 1973
<i>A. negundo</i> L.	Sapindaceae	Tree		Yes	Treshow and Stewart, 1973
<i>A. pseudoplatanus</i> L.	Sapindaceae	Tree	Deciduous	Yes	Benham <i>et al.</i> 2010; Orendovici <i>et al.</i> 2003; VanderHeyden <i>et al.</i> 2001; Vollenweider <i>et al.</i> 2003b
<i>A. rubrum</i> L.	Aceraceae	Tree	Deciduous	Yes	Samuelson, 1994; Schaub <i>et al.</i> 2003
<i>A. saccharinum</i> L.	Sapindaceae	Tree	Deciduous	Yes	Orendovici <i>et al.</i> 2003
<b>Achillea</b>					
<i>A. millefolium</i> L.	Asteraceae	Herb	Perennial	Yes	Scebba <i>et al.</i> 2006a, 2006b; Treshow and Stewart, 1973
<i>A. ptarmica</i> L.	Asteraceae	Herb	Perennial	Yes	Franzaring <i>et al.</i> 2000
<b>Actaea</b>					
<i>A. arguta</i> Nutt.	Ranunculaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Actinostrobus</b>					
<i>A. pyramidalis</i> Miq.	Cupressaceae	Tree	Coniferous	No	O'Connor <i>et al.</i> 1975
<b>Aegilops</b>					
<i>A. geniculata</i> Roth.	Poaceae			Yes	Bermejo <i>et al.</i> 2003
<i>A. triuncialis</i> L.	Poaceae			Yes	Bermejo <i>et al.</i> 2003
<b>Agastache</b>					
<i>A. urticifolia</i> (Benth.) Kuntze.	Lamiaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Agonis</b>					
<i>A. flexuosa</i> (Willd.) Sweet.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<b>Agropyron</b>					
<i>A. caninum</i> (L.) P. Beauv.	Poaceae	Grass		Yes	Treshow and Stewart, 1973
<b>Agrostis</b>					
<i>A. capillaris</i> L.	Poaceae	Grass	Perennial	Yes	Hayes <i>et al.</i> 2006; Scebba <i>et al.</i> 2006a
<i>A. vineale</i> Schreber.	Poaceae	Grass		Yes	Hayes <i>et al.</i> 2006
<b>Ailanthus</b>					
<i>A. altissima</i> (Mill.) Swingle.	Simaroubaceae	Tree	Deciduous	Yes	Bussotti and Ferretti, 2009; Gravano <i>et al.</i> 2003; Manning <i>et al.</i> 2002;
<b>Alchemilla</b>					
<i>A. sp.</i>	Rosaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Allium</b>					
<i>A. acuminatum</i> Hook.	Amaryllidaceae	Forb	Perennial	Yes	Treshow and

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
					Stewart,1973
<i>A. ursinum</i> L.	Amaryllidaceae	Forb	Perennial	Yes	Fangmeier, 1989
<b>Alnus</b>					
<i>A. incana</i> (L.) Moench.	Betulaceae	Tree		Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<i>A. viridis</i> (Chaix.) DC. ssp. <i>Viridis</i>	Betulaceae	Tree / Shrub		Yes	VanderHeyden <i>et al.</i> 2001
<b>Ambrosia</b>					
<i>A. psilostachya</i> DC.	Asteraceae	Forb	Perennial	Yes	Treshow and Stewart,1973
<b>Amelanchier</b>					
<i>A. alnifolia</i> (Nutt.) Nutt.	Rosaceae	Tree / Shrub	Deciduous	Yes	Treshow and Stewart,1973
<b>Angelica</b>					
<i>A. pinnata</i> S. Watson.	Apiaceae	Forb	Perennial	Yes	Treshow and Stewart,1973
<b>Angophora</b>					
<i>A. costata</i> (Gaertn.) Britten.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<b>Anthoxanthum</b>					
<i>A. odoratum</i> L.	Poaceae	Grass	Perennial	Yes	Dawnay and Mills, 2009; Hayes <i>et al.</i> 2006; Scebba <i>et al.</i> 2006a
<b>Anthyllis</b>					
<i>A. cornicina</i> L.	Fabaceae			No	Bermejo <i>et al.</i> 2003
<i>A. lotoides</i> L.	Fabaceae			No	Bermejo <i>et al.</i> 2003
<i>A. vulneraria</i> L.	Fabaceae	Medical plant	Perennial	Yes	Scebba <i>et al.</i> 2006a
<b>Arabidopsis</b>					
<i>A. thaliana</i> (L.) Heynh.	Brassicaceae			Yes	Hoepflinger <i>et al.</i> 2011
<b>Arabis</b>					
<i>A. petraea</i>	Brassicaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Araucaria</b>					
<i>A. heterophylla</i> (Sailsb.) Franco.	Araucariaceae	Tree	Coniferous	Yes	O'Connor <i>et al.</i> 1975
<b>Arbutus</b>					
<i>A. unedo</i> L.	Ericaceae	Tree / Shrub	Evergreen	No	Paoletti, 2005
<b>Armeria</b>					
<i>A. maritima</i> (Mill.) Willd.	Plumbaginaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Artemisia</b>					
<i>A. tridentata</i> Nutt.	Asteraceae	Shrub	Evergreen	Yes	Treshow and Stewart,1973
<b>Asclepias</b>					
<i>A. exaltata</i> L.	Apocynaceae			Yes	Burkey <i>et al.</i> 2006; Chappelka <i>et al.</i> 1997;Souza <i>et al.</i> 2006

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>A. incarnata</i> L.	Apocynaceae	Herb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<i>A. syriaca</i> L.	Apocynaceae			Yes	Bennett <i>et al.</i> 2006; Davis and Orendovici, 2006; Yuska <i>et al.</i> 2003
<b>Asimina</b>					
<i>A. triloba</i> (L.) Dunal.	Annonaceae	Tree / Shrub	Deciduous	Yes	Orendovici <i>et al.</i> 2003
<b>Aster</b>					
<i>A. engelmannii</i> (Eat.) A.Gray	Asteraceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Astrantia</b>					
<i>A. major</i> L.	Apiaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009; Manning and Godzik 2004; Manning <i>et al.</i> 2002
<b>Avena</b>					
<i>A. barbata</i> (L.) Pott. ex Link.	Poaceae	Herb	Annual or perennial	Yes	Bermejo <i>et al.</i> 2003; Scebba <i>et al.</i> 2006a
<i>A. sterilis</i> L.	Poaceae			Yes	Bermejo <i>et al.</i> 2003
<b>Banksia</b>					
<i>B. ericifolia</i> L.f.	Proteaceae	Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>B. marginata</i> Cav.	Proteaceae	Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>B. spinulosa</i> var. <i>collina</i> (R. Br.) A.S. George	Proteaceae	Shrub		Yes	O'Connor <i>et al.</i> 1975
<b>Betula</b>					
<i>B. ermanii</i> Cham.	Betulaceae	Tree		Yes	Hoshika <i>et al.</i> 2013a
<i>B. papyrifera</i> Marshall.	Betulaceae	Tree		Yes	Darbah <i>et al.</i> 2008
<i>B. pendula</i> Roth.	Betulaceae	Tree		Yes	Benham <i>et al.</i> 2010; Karlsson <i>et al.</i> 2003; Oksanen and Holopainen, 2001; Skelly <i>et al.</i> 1998; Slimestad <i>et al.</i> 1995; VanderHeyden <i>et al.</i> 2001; Wittmann <i>et al.</i> 2007; Zhang <i>et al.</i> 2001
<i>B. platyphylla</i> var. <i>japonica</i> 'Whitespire'	Betulaceae	Tree		Yes/No	Hoshika <i>et al.</i> 2013c (Yes); 2013a (No)
<i>B. pubescens</i> Ehrh.	Betulaceae	Tree	Deciduous	Yes	Paakkonen <i>et al.</i> 1997
<b>Biserrula</b>					
<i>B. pelecinus</i> L.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<b>Brachychiton</b>					
<i>B. populneus</i> (Schott. & Endl.) R. Br.	Malvaceae	Tree		No	O'Connor <i>et al.</i> 1975
<b>Brassica</b>					
<i>B. campestris</i> L.	Brassicaceae			Yes	Black <i>et al.</i> 2012
<b>Briza</b>					
<i>B. maxima</i> L.	Poaceae	Grass	Annual or perennial	Yes	Bermejo <i>et al.</i> 2003; Scebba <i>et al.</i> 2006a

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Bromus</b>					
<i>B. briziformis</i> Fisch. & C.A. Mey.	Poaceae	Grass	Annual	Yes	Treshow and Stewart,1973
<i>B. carinatus</i> Hook. & Am.	Poaceae	Grass	Perennial	Yes	Treshow and Stewart,1973
<i>B. erectus</i> Huds.	Poaceae	Grass	Perennial	Yes	Nussbaum <i>et al.</i> 2001; Scebba <i>et al.</i> 2006a
<i>B. hordeaceus</i> L.	Poaceae	Grass	Annual or biennial	Yes	Bermejo <i>et al.</i> 2003; Scebba <i>et al.</i> 2006a
<i>B. sterilis</i> L.	Poaceae			Yes	Bermejo <i>et al.</i> 2003
<i>B. tectorum</i> L.	Poaceae	Grass	Annual	Yes	Treshow and Stewart,1973
<b>Buddleia</b>					
<i>B. davidii</i> Franch.	Scrophulariaceae	Shrub		Yes	Fidley <i>et al.</i> 1997
<b>Caesalpinia</b>					
<i>C. echinata</i> Lam.	Fabaceae	Tree		Yes	Moraes <i>et al.</i> 2006
<b>Callistemon</b>					
<i>C. salignus</i> Sm. Sweet.	Myrtaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<b>Callitris</b>					
<i>C. collumellaris</i> F. Muell.	Cupressaceae	Tree	Coniferous	No	O'Connor <i>et al.</i> 1975
<i>C. rhomboidea</i> R. Br. ex Rich. & A. Rich.	Cupressaceae	Tree	Coniferous	No	O'Connor <i>et al.</i> 1975
<b>Calochortus</b>					
<i>C. nuttallii</i> Torr. & A. Gray.	Liliaceae	Forb	Perennial	Yes	Treshow and Stewart,1973
<b>Calothamnus</b>					
<i>C. sanguineus</i> Labill.	Myrtaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<b>Campanula</b>					
<i>C. rotundifolia</i> L.	Campanulaceae	Forb		No	Hayes <i>et al.</i> 2006
<i>C. spp.</i>	Campanulaceae			Yes	Skelly <i>et al.</i> 1998
<b>Campsis</b>					
<i>C. radicans</i> Seem.	Bignoniaceae	Vine	Deciduous	Yes	Oredovici <i>et al.</i> 2003
<b>Carex</b>					
<i>C. demissa</i> Hornem.	Cyperaceae	Sedge		Yes	Hayes <i>et al.</i> 2006
<i>C. echinata</i> Murray.	Cyperaceae	Sedge		Yes	Hayes <i>et al.</i> 2006
<i>C. laevigata</i> Sm.	Cyperaceae	Sedge		No	Hayes <i>et al.</i> 2006
<i>C. nigra</i> (L.) Reichard.	Cyperaceae	Sedge		Yes	Franzaring <i>et al.</i> 2000; Scebba <i>et al.</i> 2006a
<i>C. panicea</i> L.	Cyperaceae	Sedge		Yes	Hayes <i>et al.</i> 2006
<i>C. siccata</i> Dewey.	Cyperaceae	Forb	Perennial	Yes	Treshow and Stewart,1973
<b>Carpinus</b>					
<i>C. betulus</i> L.	Betulaceae	Tree		Yes	Benham <i>et al.</i> 2010; Gunthardt-Goerg <i>et al.</i> 2000
<b>Casuarina</b>					
<i>C. cristata</i> Miq.	Casuarinaceae	Tree		No	O'Connor <i>et al.</i> 1975

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>C. cunninghamiana</i> Miq.	Casuarinaceae	Tree	Evergreen	No	O'Connor <i>et al.</i> 1975
<i>C. glauca</i> Sieber.	Casuarinaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>C. meulleriana</i> Miq.	Casuarinaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>C. stricta</i> Dryand.	Casuarinaceae	Tree	Evergreen	Yes	O'Connor <i>et al.</i> 1975
<i>C. torulosa</i> Dryand.	Casuarinaceae	Tree		No	O'Connor <i>et al.</i> 1975
<b>Catalpa</b>					
<i>C. speciosa</i> (Warder.) Warder. ex Engelm.	Bignoniaceae	Tree	Deciduous	Yes	Orendovici <i>et al.</i> 2003
<b>Centaurea</b>					
<i>C. jacea</i> L.	Asteraceae	Herb	Perennial	Yes	Francini <i>et al.</i> 2008; Nussbaum <i>et al.</i> 2001; Ramo <i>et al.</i> 2006
<i>C. nigra</i> L.	Asteraceae	Forb	Perennial	Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<i>C. scabiosa</i> L.	Asteraceae	Forb	Perennial	Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<b>Ceratonia</b>					
<i>C. siliqua</i> L.	Fabaceae	Tree / Shrub	Evergreen	Yes	Orendovici <i>et al.</i> 2003; Ribas <i>et al.</i> 2005
<b>Cercis</b>					
<i>C. canadensis</i> L.	Fabaceae	Tree / Shrub	Deciduous	Yes	Orendovici <i>et al.</i> 2003
<b>Chenopodium</b>					
<i>C. fremontii</i> S. Wats.	Amaranthaceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<i>C. spp.</i>	Amaranthaceae	Herb	Annual/perennial	Yes	Skelly <i>et al.</i> 1998
<b>Chilopsis</b>					
<i>C. linearis</i> (Cav.) Sweet.	Bignoniaceae	Tree / Shrub		No	Temple, 1989
<b>Cichorium</b>					
<i>C. intybus</i> L.	Asteraceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Cinnamomum</b>					
<i>C. camphora</i> (L.) J. Presl.	Lauraceae	Tree	Evergreen	Yes/No	O'Connor <i>et al.</i> 1975 (No); Zhang <i>et al.</i> 2012 (Yes)
<b>Cirsium</b>					
<i>C. arvense</i> (L.) Scop.	Asteraceae	Forb	Perennial	No/Yes	Hayes <i>et al.</i> 2006; Treshow and Stewart, 1973
<i>C. dissectum</i> (L.) Hill	Asteraceae	Forb		Yes	Franzaring <i>et al.</i> 2000
<b>Clematis</b>					
<i>C. vitalba</i> L.	Ranunculaceae	Shrub		Yes	Bussotti and Ferretti, 2009; Manning <i>et al.</i> 2002; Orendovici <i>et al.</i> 2003



Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>C. spp.</i> L.	Ranunculaceae	Vine		No	Novak <i>et al.</i> 2003
<b>Collomia</b>					
<i>C. linearis</i> Nutt.	Polemoniaceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<b>Colutea</b>					
<i>C. arborescens</i> L.	Fabaceae	Shrub	Deciduous	Yes	Orendovici <i>et al.</i> 2003
<b>Conium</b>					
<i>C. maculatum</i> L.	Apiaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Corchorus</b>					
<i>C. olitorius</i> L.	Malvaceae	Herb	Annual	Yes	Madkour and Laurence, 2002
<b>Cornus</b>					
<i>C. alba</i> L.	Cornaceae	Shrub	Suckering	Yes	Novak <i>et al.</i> 2003
<i>C. sanguinea</i> L.	Cornaceae	Shrub	Deciduous	Yes/No	Manning and Godzik, 2004 (Yes); Orendovici <i>et al.</i> 2003 (No); VanderHeyden <i>et al.</i> 2001 (No)
<b>Corylus</b>					
<i>C. avellana</i> L.	Betulaceae	Shrub	Deciduous	Yes/No	Benham <i>et al.</i> 2010 (Yes); Bussotti and Ferretti, 2009 (Yes); Manning <i>et al.</i> 2002; Zhang <i>et al.</i> 2001 (Yes); VanderHeyden <i>et al.</i> 2001 (No); Vollenweider <i>et al.</i> 2003b (Yes)
<b>Crataegus</b>					
<i>C. monogyna</i> Jacq.	Rosaceae	Shrubs / small trees		Yes	Novak <i>et al.</i> 2003; Orendovici <i>et al.</i> 2003
<b>Cryptogamma</b>					
<i>C. crispa</i> (L.) R.Br. ex Hook.	Pteridaceae	Forb		No	Hayes <i>et al.</i> 2006
<b>Cryptomeria</b>					
<i>C. japonica</i> (L.f) D. Don	Cupressaceae	Tree	Coniferous	Yes	Watanabe <i>et al.</i> 2010b
<b>Cyclobalanopsis</b>					
<i>C. glauca</i> (Thunb.) Oerst. or <i>C. repandifolia</i> (Liao.) Liao.	Fagaceae	Tree	Evergreen	Yes	Zhang <i>et al.</i> 2014; 2012
<b>Cynosurus</b>					
<i>C. echinatus</i> L.	Poaceae	Grass		Yes/No	Bermejo <i>et al.</i> 2003; Scebba <i>et al.</i> 2006a (No)
<b>Dactylis</b>					
<i>D. glomerata</i> L.	Poaceae	Grass	Perennial	Yes	Wagg <i>et al.</i> 2013
<b>Danthonia</b>					
<i>D. decumbens</i> (L.) DC.	Poaceae	Grass	Perennial	Yes	Franzaring <i>et al.</i> 2000

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Descurainia</b>					
<i>D. californica</i> (Gray.) O.E.Schulz	Brassicaceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<b>Dodonaea</b>					
<i>D. attenuata</i> A. Cunn.	Sapindaceae	Shrub	Sapindaceae	No	O'Connor <i>et al.</i> 1975
<b>Dryas</b>					
<i>D. octopetala</i> L.	Rosaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Echinacea</b>					
<i>E. purpurea</i> (L.) Moench.	Asteraceae	Herb	Perennial	Yes	Szantoi <i>et al.</i> 2007
<b>Epilobium</b>					
<i>E. angustifolium</i> L. or <i>Chamerion angustifolium</i> (L.) Holub.	Onagraceae	Herb	Perennial	Yes	Skelly <i>et al.</i> 1998; Treshow and Stewart, 1973
<i>E. hirsutum</i> L.	Onagraceae	Forb	Perennial	Yes	Scebba <i>et al.</i> 2006a
<i>E. montanum</i> L.	Onagraceae	Herb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<i>E. watsoni</i> Barbey.	Onagraceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Eriogonum</b>					
<i>E. heracleoides</i> Nutt.	Polygonaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Eriophorum</b>					
<i>E. angustifolium</i> Honck.	Cyperaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<i>E. vaginatum</i> L.	Cyperaceae	Sedge	Perennial	No	Mörsky <i>et al.</i> 2011
<b>Eucalyptus</b>					
<i>E. aggregata</i> H. Deane. et Maiden	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. alpina</i> Lindl.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. astringens</i> (Maiden.) Maiden.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. bosistoana</i> F. Muell.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. botryoides</i> Sm.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. brockwayi</i> C. A. Gardner.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. caesia</i> Benth.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. calophylla</i> R. Br. ex var. <i>rosea</i> Lindl. or <i>Corymbia calophylla</i> (R.Br.) K.D.Hill & L.A.S. Johnson.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. camaldulensis</i> Dehnh.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<i>E. campaspe</i> S. Moore.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. citriodora</i> Hook. or <i>Corymbia citriodora</i> (Hook.) K.D. Hill & L.A.S. Johnson.	Myrtaceae	Tree	Evergreen	No	O'Connor <i>et al.</i> 1975
<i>E. cladocalyx</i> F. Muell, var. <i>nana</i> Hort.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. cornuta</i> Labill.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. cosmophylla</i> F. Muell.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. crenulata</i> Blakely & Beuzev.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>E. dielsii</i> C. A. Gardner.	Myrtaceae	Shrub	Evergreen	No	O'Connor <i>et al.</i> 1975

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>E. elata</i> Dehnh.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. ficifolia</i> F. Muell. or <i>Corymbia ficifolia</i> (F. Muell.) K.D. Hill. & L.A.S. Johnson.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. flocktoniae</i> Maiden.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. forrestiana</i> Diels.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. gardneri</i> Maiden.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. globulus</i> Labill.	Myrtaceae	Tree	Evergreen	Yes	O'Connor et al. 1975
<i>E. gomphocephala</i> DC.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. gracilis</i> F. Muell.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. hemiphloia</i> var. <i>albens</i> (Benth.) Maiden.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. kitsoniana</i> (Kuehm.) Maiden	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. kondininensis</i> Maiden et Blakely	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. largiflorens</i> F. Muell.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. leucoxydon</i> F. Muell.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. maculata</i> Hook. or <i>Corymbia maculata</i> (Hook.) K.D. Hill. & L.A.S. Johnson.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. melliodora</i> A. Cunn. ex Schau.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. nicholii</i> Maiden et Blakely	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. nutans</i> F. Muell.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. occidentalis</i> Endl.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. pauciflora</i> Sieber. ex Spreng.	Myrtaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>E. pellita</i> F. Muell.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. platypus</i> Hook.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. polyanthemus</i> Schauer.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. radiata</i> Sieb. ex DC.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. riminalis</i> Labill.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. robusta</i> Sm.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. sideroxydon</i> A. Cunn. ex Wools var. <i>rosea</i>	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. spathulata</i> Hook.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. St. johnii</i> R. T. Bak.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. steedmanii</i> C. A. Gardner.	Myrtaceae	Tree / Shrub		Yes	O'Connor et al. 1975
<i>E. torquata</i> Luehm.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. viridis</i> R. T. Bak.	Myrtaceae	Tree		Yes	O'Connor et al. 1975
<i>E. websteriana</i> Maiden.	Myrtaceae	Tree		No	O'Connor et al. 1975
<i>E. woodwardii</i> Maiden.	Myrtaceae	Tree		No	O'Connor et al. 1975
<b>Eupatorium</b>					
<i>E. connabinum</i> L.	Asteraceae	Herb	Perennial	Yes	Franzaring et al. 2000
<i>E. perfoliatum</i> L.	Asteraceae	Herb	Perennial	Yes	Orendovici et al. 2003
<b>Euphorbia</b>					
<i>E. dulcis</i> 'Chameleon'	Euphorbiaceae	Herb	Perennial	Yes	Bussotti and Ferretti,

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
					2009
<b>Euphrasia</b>					
<i>E. kernerii</i> Wettst.	Orobanchaceae			Yes	Bussotti and Ferretti, 2009
<b>Fagus</b>					
<i>F. crenata</i> Blume.	Fagaceae	Tree		Yes	Azuchi <i>et al.</i> 2014; Hoshika <i>et al.</i> 2012b; Watanabe <i>et al.</i> 2010a, 2012, 2013, 2014; Yamaguchi <i>et al.</i> 2007a, 2007b, 2010; Yonekura <i>et al.</i> 2001
<i>F. sylvatica</i> L.	Fagaceae	Tree	Deciduous	Yes	Baumgarten <i>et al.</i> 2000; Benham <i>et al.</i> 2010; Bortier <i>et al.</i> 2000; Braun <i>et al.</i> 2004, 2007; 2010; Bussotti and Ferretti, 2009; Cascio <i>et al.</i> 2010; Clark <i>et al.</i> 2000; Gerosa <i>et al.</i> 2003, 2008, 2009; Gunthardt-Goerg <i>et al.</i> 2000; Kitao <i>et al.</i> 2009; Landolt <i>et al.</i> 2000; Nikolova <i>et al.</i> 2010; Novak <i>et al.</i> 2008; Nunn <i>et al.</i> 2005a and 2005b; Olbrich <i>et al.</i> 2010; Pearson and Mansfield, 1993; Pretzsch <i>et al.</i> 2010; Stribley and Ashmore, 2002; VanderHeyden <i>et al.</i> 2001; Vollenweider <i>et al.</i> 2003b; Zhang <i>et al.</i> 2001
<i>F. sylvatica</i> L.	Fagaceae	Tree	Deciduous	No	Orendovici <i>et al.</i> 2003
<b>Festuca</b>					
<i>F. ovina</i> L.	Poaceae	Grass		Yes	Hayes <i>et al.</i> 2006
<i>F. rubra</i> L.	Poaceae	Grass		Yes	Hayes <i>et al.</i> 2006
<b>Fragaria</b>					
<i>F. ovalis</i> (Lehm.) Rydb. or <i>F. virginiana</i> Duchesne	Rosaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>F. vesca</i> L.	Rosaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009; Manninen <i>et al.</i> 2003
<b>Frangula</b>					
<i>F. alnus</i> Mill. or <i>Rhamnus frangula</i>	Rhamnaceae	Shrub	Deciduous	Yes	VanderHeyden <i>et al.</i>

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
L.					2001
<b>Fraxinus</b>					
<i>F. americana</i> L.	Oleaceae	Tree		Yes	Schaub <i>et al.</i> 2003
<i>F. angustifolia</i> Vahl.	Oleaceae	Tree	Deciduous	No	Orendovici <i>et al.</i> 2003
<i>F. excelsior</i> L.	Oleaceae	Tree	Deciduous	Yes	Benham <i>et al.</i> 2010; Bussotti and Ferretti, 2009; Gerosa <i>et al.</i> 2003, 2009; Gunthardt-Goerg <i>et al.</i> 2000; Landolt <i>et al.</i> 2000; Novak <i>et al.</i> 2003, 2005; Orendovici <i>et al.</i> 2003; Paoletti <i>et al.</i> 2008; Reiner <i>et al.</i> 1996; VanderHeyden <i>et al.</i> 2001; Zhang <i>et al.</i> 2001;
<i>F. ornus</i> L.	Oleaceae	Tree	Deciduous	Yes	Orendovici <i>et al.</i> 2003; Paoletti <i>et al.</i> 2010
<b>Galium</b>					
<i>G. bifolium</i> S. Wats.	Rubiaceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<i>G. saxatile</i> L.	Rubiaceae	Forb		No	Hayes <i>et al.</i> 2006
<b>Gayophytum</b>					
<i>G. racemosum</i> Torrey. & A. Gray.	Onagraceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<b>Gentiana</b>					
<i>G. amarella</i> (L.) Borner.	Gentianaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>G. asclepiadea</i> L.	Gentianaceae	Forb	Perennial	Yes	Bussotti and Ferretti, 2009; Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<b>Geranium</b>					
<i>G. fremontii</i> Torr. ex Gray or <i>G. caespitosum</i> E. James.	Geraniaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>G. richardsonii</i> Fisch. & Trautv.	Geraniaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>G. spp.</i>	Geraniaceae			Yes	Bussotti and Ferretti, 2009
<b>Globularia</b>					
<i>G. nudicaulis</i> L.	Plantaginaceae			Yes	Bussotti and Ferretti, 2009
<b>Grecillea</b>					
<i>G. robusta</i> A. Cunn. ex R.Br.	Proteaceae	Tree		Yes	O'Connor <i>et al.</i> 1975
<b>Hakea</b>					
<i>H. laurina</i> R. Br.	Proteaceae	Tree / Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>H. saligna</i> (Andr.) Knight. or <i>H.</i>	Proteaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>salicifolia</i> (Vent.) B.L. Burtt.					
<i>H. suaveolens</i> R. Br. or <i>H. drupacea</i> (C.F.Gaertn.) Roem. & Schult.	Proteaceae	Tree / Shrub	Evergreen	No	O'Connor <i>et al.</i> 1975
<b>Hardenbergia</b>					
<i>H. violacea</i> (Schneev.) Stearn.	Fabaceae	Climbing	Evergreen	No	O'Connor <i>et al.</i> 1975
<b>Hedera</b>					
<i>H. helix</i> L.	Araliaceae	Vine	Evergreen	Yes	Torre <i>et al.</i> 1998
<b>Hedysarum</b>					
<i>H. boreale</i> Nutt.	Fabaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Helianthus</b>					
<i>H. annuus</i> L.	Asteraceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<i>H. hirsutus</i> Raf.	Asteraceae	Forb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Helleborus</b>					
<i>H. niger</i> L.	Ranunculaceae	Evergreen	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Hibiscus</b>					
<i>H. syriacus</i> L.	Malvaceae	Shrub	Deciduous	Yes	Paoletti <i>et al.</i> 2009
<b>Hieracium</b>					
<i>H. pilosella</i> L.	Asteraceae		Perennial	Yes	Scebba <i>et al.</i> 2006a
<i>H. sp.</i>	Asteraceae			Yes	Bussotti and Ferretti, 2009
<b>Holcus</b>					
<i>H. lanatus</i> L.	Poaceae	Grass	Perennial	Yes/No	Hayes <i>et al.</i> 2006 (No); Scebba <i>et al.</i> 2006a (Yes); Tonneijck <i>et al.</i> 2004 (Yes)
<b>Horminum</b>					
<i>H. pyrenaicum</i> L.	Lamiaceae		Perennial	Yes	Bussotti and Ferretti, 2009
<b>Humulus</b>					
<i>H. lupulus</i> L.	Cannabaceae	Vine	Perennial-Deciduous	Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<b>Hypericum</b>					
<i>H. perforatum</i> L.	Hypericaceae	Tree / Shrub	Perennial	Yes	Orendovici <i>et al.</i> 2003; Scebba <i>et al.</i> 2006a
<b>Iberis</b>					
<i>I. carnosa</i> Willd.	Brassicaceae	Forb	Annual or perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Ilex</b>					
<i>I. aquifolium</i> L.	Aquifoliaceae	Tree	Perennial	Yes	Ranford and Reiling, 2007a, 2007b
<i>I. integra</i> Thunb.	Aquifoliaceae	Tree	Perennial	Yes	Zhang <i>et al.</i> 2012
<b>Impatiens</b>					

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>I. parviflora</i> DC.	Balsaminaceae	Forb	Annual	Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<b>Ipomoea</b>					
<i>I. nil</i> 'Scarlet O'Hara'	Convolvulaceae			Yes	Alves <i>et al.</i> 2011; Dafre' -Martinelli <i>et al.</i> 2011
<b>Juncus</b>					
<i>J. effusus</i> L.	Juncaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<i>J. squarrosus</i> L.	Juncaceae	Forb		No	Hayes <i>et al.</i> 2006
<i>J. sp.</i>	Juncaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Knautia</b>					
<i>K. arvensis</i> (L.) Koutl.	Dipsacaceae	Herb	Perennial	Yes	Nussbaum <i>et al.</i> 2001
<i>K. spp.</i>	Dipsacaceae			Yes	Bussotti and Ferretti, 2009
<b>Koeleria</b>					
<i>K. pyramidata</i> (Lam.) P. Beauv.	Poaceae	Grass	Perennial	Yes	Scebba <i>et al.</i> 2006a
<b>Laburnum</b>					
<i>L. alpinum</i> J. Presl.	Fabaceae	Tree	Deciduous	Yes	Bussotti and Ferretti, 2009
<b>Lactuca</b>					
<i>L. seriola</i> L.	Asteraceae	Plant	Annual or biennial	Yes	Bussotti and Ferretti, 2009
<b>Lagunaria</b>					
<i>L. patersonia</i> (Andrews.) G. Don.	Malvaceae	Tree	Evergreen	Yes	O'Connor <i>et al.</i> 1975
<b>Lamottea</b>					
<i>L. diana</i> (Webb.) G. Lopez.	Asteraceae	Forb	Perennial	Yes	Calatayud <i>et al.</i> 2011a
<b>Larix</b>					
<i>L. decidua</i> Mill.	Pinaceae	Tree	Coniferous	Yes	Wieser <i>et al.</i> 2013; Wieser and Havranek, 1996
<i>L. gmelinii</i> (Rupr.) Rupr. var. <i>japonica</i>	Pinaceae	Tree		Yes	Koike <i>et al.</i> 2012
<i>L. kaempferi</i> (Lamb.) Carr.	Pinaceae	Tree	Coniferous	Yes	Koike <i>et al.</i> 2012; Watanabe <i>et al.</i> 2010b
<b>Lathyrus</b>					
<i>L. lanzwertii</i> Kell.	Fabaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>L. pauciflorus</i> Fern.	Fabaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Lemna</b>					
<i>L. gibba</i> L.	Araceae	Aquatic	Free-floating	Yes	Forberg <i>et al.</i> 1987
<b>Leptospermum</b>					
<i>L. laevigatum</i> (Gaertn.) F. Muell.	Myrtaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<b>Liquidambar</b>					
<i>L. formosana</i> Hance.	Hamalidaceae	Tree	Deciduous	Yes	Zhang <i>et al.</i> 2012

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Liriodendron</b>					
<i>L. chinense</i> (Hemsl.) Sarg.	Magnoliaceae	Tree	Deciduous	Yes	Zhang <i>et al.</i> 2012
<i>L. tulipifera</i> L.	Magnoliaceae	Tree		Yes	Benham <i>et al.</i> 2010; Pellegrini <i>et al.</i> 2011
<b>Lolium</b>					
<i>L. perenne</i> L.	Poaceae			Yes	Hayes <i>et al.</i> 2009
<i>L. rigidum</i> (Gaudin.) Weiss. ex Nyman	Poaceae			Yes	Bermejo <i>et al.</i> 2003
<b>Lonicera</b>					
<i>L. etrusca</i> Santi.	Caprifoliaceae	Climbing	Deciduous perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Lotus</b>					
<i>L. corniculatus</i> L.	Fabaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Lychnis</b>					
<i>L. flos-cuculi</i> L.	Caryophyllaceae	Herb	Perennial	Yes	Franzaring <i>et al.</i> 2000; Tonneijck <i>et al.</i> 2004
<i>L. salicaria</i> L.	Caryophyllaceae			Yes	Franzaring <i>et al.</i> 2000
<b>Mahonia</b>					
<i>M. repens</i> (Lindl.) G. Don.	Berberidaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Malva</b>					
<i>M. parviflora</i> L.	Malvaceae	Herb	Perennial	Yes	El-Khatib, 2003
<b>Medicago</b>					
<i>M. lupulina</i> L.	Fabaceae	Weed	Annual or biennial	No	Pfleeger <i>et al.</i> 2010
<i>M. minima</i> L. Bartal.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>M. sativa</i> L.	Fabaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Melaleuca</b>					
<i>M. armillaris</i> (Sol. ex Gaertn.) Sm.	Myrtaceae	Tree / Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>M. decussata</i> R. Br.	Myrtaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<i>M. ericifolia</i> Sm.	Myrtaceae	Tree / Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>M. halmaturorum</i> Miq.	Myrtaceae	Tree / Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>M. hypericifolia</i> Sm.	Myrtaceae	Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>M. incana</i> R. Br.	Myrtaceae	Shrub		No	O'Connor <i>et al.</i> 1975
<i>M. lanceolata</i> Otto.	Myrtaceae	Tree / Shrub		Yes	O'Connor <i>et al.</i> 1975
<i>M. linariifolia</i> Smith.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>M. nesophila</i> F. Muell.	Myrtaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<i>M. squarrosa</i> Donn. ex Sm.	Myrtaceae	Shrub	summer-flowering	No	O'Connor <i>et al.</i> 1975
<i>M. styphelioides</i> Sm.	Myrtaceae	Tree		No	O'Connor <i>et al.</i> 1975
<i>M. wilsonii</i> F. Muell.	Myrtaceae	Shrub		No	O'Connor <i>et al.</i> 1975
<b>Melica</b>					
<i>M. uniflora</i> Retz.	Poaceae	Grass	Perennial	Yes	Fangmeier, 1989



Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Melilotus</b>					
<i>M. indicus</i> (L.) All.	Fabaceae	Herb	Annual or biennial	Yes	El-Khatib, 2003
<b>Melissa</b>					
<i>M. officinalis</i> L.	Lamiaceae	Herb	Perennial	Yes	Döring <i>et al.</i> 2014
<b>Mentha</b>					
<i>M. sp.</i> L.	Lamiaceae	Herb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Mertensia</b>					
<i>M. arizonica</i> Greene.	Boraginaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Mimulus</b>					
<i>M. guttatus</i> DC.	Scrophulariaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>M. moschatus</i> Dougl. ex Lindl.	Scrophulariaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Mitella</b>					
<i>M. guttatus</i> DC.	Saxifragaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Molinia</b>					
<i>M. caerulea</i> (L.) Moench.	Poaceae	Herb	Perennial	Yes	Franzaring <i>et al.</i> 2000; Tonneijck <i>et al.</i> 2004
<b>Morus</b>					
<i>M. nigra</i> L.	Moraceae	Tree	Deciduous	Yes	Skelly <i>et al.</i> 1998; VanderHeyden <i>et al.</i> 2001; Zhang <i>et al.</i> 2001
<b>Myoporum</b>					
<i>M. insulare</i> R. Br.	Scrophulariaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<b>Myrtus</b>					
<i>M. communis</i> L.	Myrtaceae	Tree / Shrub	Evergreen	No	Orendovici <i>et al.</i> 2003
<b>Nardus</b>					
<i>N. stricta</i> L.	Poaceae	Grass		Yes	Hayes <i>et al.</i> 2006
<b>Narthecium</b>					
<i>N. ossifragum</i> (L.) Huds.	Nartheciaceae	Forb		No	Hayes <i>et al.</i> 2006
<b>Neolitsea</b>					
<i>N. sericea</i> (Blume.) Koidzumi.	Lauraceae	Tree		Yes	Zhang <i>et al.</i> 2012
<b>Oenothera</b>					
<i>O. japonica</i> L.	Onagraceae	Herb	Perennial	Yes	Skelly <i>et al.</i> 1998
<b>Ornithopus</b>					
<i>O. compressus</i> L.	Fabaceae			No	Bermejo <i>et al.</i> 2003
<b>Osmorhiza</b>					
<i>O. occidentalis</i> (Nutt.) Torr.	Apiaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Oxalis</b>					

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>O. acetosella</i> L.	Oxalidaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Oxyria</b>					
<i>O. digyna</i> (L.) Hill.	Polygonaceae	Forb		No	Hayes <i>et al.</i> 2006
<b>Parthenocissus</b>					
<i>P. quinquefolia</i> (L.) Planch.	Vitaceae	Vine	Deciduous	Yes	Manning and Godzik, 2004; Orendovici <i>et al.</i> 2003
<b>Pastinaca</b>					
<i>P. sativa</i> L.	Apiaceae	Vegetable	Biennial	Yes	Bussotti and Ferretti, 2009
<b>Paxistima</b>					
<i>P. myrsinites</i> (Pursh.) Raf.	Celastraceae	Shrub	Perennial	Yes	Treshow and Stewart, 1973
<b>Phacelia</b>					
<i>P. heterophylla</i> Pursh.	Boraginaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Phleum</b>					
<i>P. alpinum</i> L.	Poaceae	Grass	Perennial	Yes	Danielsson <i>et al.</i> 1999
<i>P. pratense</i> L.	Poaceae	Grass	Perennial	Yes	Danielsson <i>et al.</i> 2013;1999
<b>Photinia</b>					
<i>Photinia x fraseri</i> 'Red Robin'	Rosaceae	Shrub	Evergreen	Yes	Zhang <i>et al.</i> 2012
<b>Picea</b>					
<i>P. abies</i> (L.) H. Karst.	Pinaceae	Tree	Coniferous	Yes	Braun <i>et al.</i> 2004; Hofer <i>et al.</i> 2008; Karlsson <i>et al.</i> 2004; Kivimaenpaa <i>et al.</i> 2004; Landolt <i>et al.</i> 2000; Magel <i>et al.</i> 1990 ; Muller <i>et al.</i> 1996; ; Nikolova <i>et al.</i> 2010; Nunn <i>et al.</i> 2005b; Ogner, 1993; Percy <i>et al.</i> 2009; Pretzsch <i>et al.</i> 2010; Siefertmann-Harms <i>et al.</i> 2005; Thomas <i>et al.</i> 2005; Vollenweider <i>et al.</i> 2003b; Wieser and Havranek, 1996; Wieser <i>et al.</i> 2013;Wulff <i>et al.</i> 1996
<i>P. abies</i> (L.) H. Karst.	Pinaceae	Tree	Coniferous	No	Braun <i>et al.</i> 2007
<i>P. rubens</i> Sarg.	Pinaceae	Tree	Coniferous	Yes	Thornton <i>et al.</i> 1990
<b>Pimpinella</b>					
<i>P. major</i> (L.) Huds.	Apiaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Pinus</b>					

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>P. armandii</i> Franch.	Pinaceae	Coniferous	Evergreen	Yes	Shan <i>et al.</i> 1996;1995
<i>P. canariensis</i> C.Sm	Pinaceae	Coniferous	Evergreen	Yes	Then <i>et al.</i> 2009
<i>P. cembra</i> L.	Pinaceae	Tree	Coniferous	Yes	Manning <i>et al.</i> 2002; Vollenweider <i>et al.</i> 2003b; Wieser <i>et al.</i> 2013
<i>P. densiflora</i> Sieb. et Zucc.	Pinaceae	Tree	Coniferous	Yes	Nakaji and Izuta, 2001; Nakaji <i>et al.</i> 2004; Shan <i>et al.</i> 1997; Watanabe <i>et al.</i> 2010b
<i>P. ellioti</i> var. Densa	Pinaceae	Tree		Yes	Evans and Fitzgerald, 1993
<i>P. halepensis</i> Mill.	Pinaceae	Tree		Yes	Elvira <i>et al.</i> 2007; Soda <i>et al.</i> 2000
<i>P. ponderosa</i> Douglas ex C. Laws.	Pinaceae	Tree		Yes	Anderson <i>et al.</i> 2003; Fares <i>et al.</i> 2010; Grulke <i>et al.</i> 1998; Temple <i>et al.</i> 1992
<i>P. pungens</i> Lamb.	Pinaceae	Tree	Coniferous	No	Neufeld <i>et al.</i> 2000
<i>P. radiata</i> D. Don	Pinaceae	Tree		Yes	Calzada <i>et al.</i> 2001
<i>P. sylvestris</i> L.	Pinaceae	Tree	Coniferous	Yes	Augustaitis and Bytnerowicz, 2008; Jokela <i>et al.</i> 2011; Landolt <i>et al.</i> 2000; Suorsa <i>et al.</i> 2002; Wingsle <i>et al.</i> 1992; Wulff <i>et al.</i> 1996
<i>P. taeda</i> L.	Pinaceae	Tree		Yes	Barbo <i>et al.</i> 2002; Horton <i>et al.</i> 1990; Kuehler and Flagler, 1999; Manning <i>et al.</i> 2003; Richardson <i>et al.</i> 1992
<i>P. uncinata</i> Raymond ex A. DC	Pinaceae	Tree	Pinaceae	Yes	de Quijano <i>et al.</i> 2012
<i>P. virginiana</i> Mill.	Pinaceae	Tree	Coniferous	No	Neufeld <i>et al.</i> 2000
<b>Pistacia</b>					
<i>P. lentiscus</i> L.	Anacardiaceae	Tree / Shrub	Evergreen	Yes	Reig-Arminana <i>et al.</i> 2004
<b>Pittosporum</b>					
<i>P. phillyraeoides</i> D.C.	Pittosporaceae	Tree / Shrub		No	O'Connor <i>et al.</i> 1975
<b>Plantago</b>					
<i>P. lanceolata</i> L.	Plantaginaceae	Forb	Perennial	Yes	Franzaring <i>et al.</i> 2000; Kolliker <i>et al.</i> 2008; Nussbaum <i>et al.</i> 2001; Scebba <i>et al.</i> 2006a; Tonnejck <i>et al.</i> 2004
<i>P. lanceolata</i> L.	Plantaginaceae	Forb	Perennial	No	Hayes <i>et al.</i> 2006
<i>P. major</i> L.	Plantaginaceae	Herb	Perennial	Yes	Black <i>et al.</i> 2010; Scebba <i>et al.</i> 2006a;

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
					Skelly <i>et al.</i> 1998; Zheng <i>et al.</i> 2000
<i>P. sp.</i> L.	Plantaginaceae	Herb		Yes	Bussotti and Ferretti, 2009; Orendovici <i>et al.</i> 2003
<b>Poa</b>					
<i>P. pratensis</i> L. Lato.	Poaceae	Grass	Perennial	Yes	Scebba <i>et al.</i> 2006a, 2006b; Treshow and Stewart, 1973
<b>Polemonium</b>					
<i>P. foliosissimum</i> A.Gray.	Polemoniaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Polygala</b>					
<i>P. chamaebuxus</i> L.	Polygalaceae			Yes	Bussotti and Ferretti, 2009
<b>Polygonatum</b>					
<i>P. sp.</i>	Asparagaceae			Yes	Bussotti and Ferretti, 2009
<b>Polygonum</b>					
<i>P. douglasii</i> Greene	Polygonaceae	Forb	Annual	Yes	Treshow and Stewart, 1973
<i>P. sp.</i>	Polygonaceae	Forb		Yes	Bussotti and Ferretti, 2009
<b>Populus</b>					
<i>P. deltoides</i> Bart. (ILL-129)	Salicaceae	Tree	Deciduous	Yes	Street <i>et al.</i> 2011
<i>P. deltoides</i> x <i>P. caudina</i> (clone NE359)	Salicaceae	Tree	Deciduous	Yes	Wei <i>et al.</i> 2004
<i>P. deltoides</i> x <i>P. nigra</i>	Salicaceae	Tree	Deciduous	Yes	Dumont <i>et al.</i> 2013
<i>P. deltoides</i> x <i>P. trichocarpa</i>	Salicaceae	Tree	Deciduous	Yes	Reich, 1983
<i>P. maximoviczii</i> Henry x <i>berolinensis</i> Dippel	Salicaceae	Tree		Yes	Hoshika <i>et al.</i> 2012a, 2013b;
<i>P. maximowiszii</i> Henry x <i>P.</i> <i>trichocarpa</i> Torr. & Gray (clone NE388)	Salicaceae	Tree	Deciduous	Yes	Orendovici-Best <i>et al.</i> 2008; Wei <i>et al.</i> 2004
<i>P. nigra</i> L.	Salicaceae	Tree		Yes	Benham <i>et al.</i> 2010; Bortier <i>et al.</i> 2000; Gerosa <i>et al.</i> 2009; Novak <i>et al.</i> 2003, 2005
<i>P. tremuloides</i> Michx.	Salicaceae	Tree	Deciduous	Yes	Karnosky <i>et al.</i> 1998; Treshow and Stewart, 1973
<i>P. trichocarpa</i> Torr. & Gray (93-968)	Salicaceae	Tree	Deciduous	Yes	Street <i>et al.</i> 2011
<i>P. trichocarpa</i> Torr. & Gray x <i>P.</i> <i>deltoides</i> Bart (ILL-129) [F2 mapping population (Family 331)]	Salicaceae	Tree	Deciduous	Yes	Street <i>et al.</i> 2011
<b>Potentilla</b>					
<i>P. erecta</i> Uspenski ex Ledeb.	Rosaceae	Forb		Yes	Bussotti and Ferretti, 2009; Hayes <i>et al.</i> 2006

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>P. fruticosa</i> L. or <i>Dasiphora fruticosa</i> (L.) Rydb.	Rosaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Primula</b>					
<i>P. vulgaris</i> Huds.	Primulaceae		Perennial	Yes	Bussotti and Ferretti, 2009
<b>Prunus</b>					
<i>P. americana</i> Marsh.	Rosaceae	Tree / Shrub		Yes	Orendovici <i>et al.</i> 2003
<i>P. avium</i> (L.) L.	Rosaceae	Tree	Deciduous	Yes	Novak <i>et al.</i> 2003; VanderHeyden <i>et al.</i> 2001; Zhang <i>et al.</i> 2001
<i>P. serotina</i> Ehrh.	Rosaceae	Tree		Yes	Benham <i>et al.</i> 2010; Bennett <i>et al.</i> 2006; Chappelka <i>et al.</i> 1997; Davis and Orendovici, 2006; Fredericksen <i>et al.</i> 1995, 1996; Ghosh <i>et al.</i> 1998; Gunthardt-Goerg <i>et al.</i> 2000; Kouterick <i>et al.</i> 2000; Lee <i>et al.</i> 1999; Long and Davis, 1991; Orendovici-Best <i>et al.</i> 2008; Samuelson, 1994; Schaub <i>et al.</i> 2003; Skelly <i>et al.</i> 1997, 1998; VanderHeyden <i>et al.</i> 2001; Vollenweider <i>et al.</i> 2003a; Yуска <i>et al.</i> 2003; Zhang <i>et al.</i> 2001, 2010
<i>P. spinosa</i> L.	Rosaceae	Tree			Benham <i>et al.</i> 2010; Orendovici <i>et al.</i> 2003
<b>Psidium</b>					
<i>P. guajava</i> L. 'Paluma'	Myrtaceae	Tree	Fruit	Yes	Alves <i>et al.</i> 2011; Pina and Moraes, 2010; de Rezende and Furlan, 2009; Pina and Moraes, 2007; Furlan <i>et al.</i> 2007
<b>Quercus</b>					
<i>Q. faginea</i> Lam.	Fagaceae	Tree		Yes	Calatayud <i>et al.</i> 2011b
<i>Q. gambelii</i> Nutt.	Fagaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>Q. ilex</i> L.	Fagaceae	Tree		Yes	Baldantoni <i>et al.</i> 2011; Ribas <i>et al.</i> 2005
<i>Q. ilex</i> L. <i>subsp.</i> <i>Ballota</i>	Fagaceae	Tree		Yes	Calatayud <i>et al.</i> 2011b
<i>Q. kelloggii</i> Newb.	Fagaceae	Tree		Yes	Handley and Grulke,

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
					2008
<i>Q. mongolica</i> var. <i>crispula</i> Fisch. ex Ledeb.	Fagaceae	Tree		Yes	Watanabe <i>et al.</i> 2013
<i>Q. pyrenaica</i> Willd.	Fagaceae	Tree		Yes	Calatayud <i>et al.</i> 2011b
<i>Q. robur</i> L.	Fagaceae	Tree		Yes	Gerosa <i>et al.</i> 2008
<i>Q. rubra</i> L.	Fagaceae	Tree	Deciduous	Yes	Calatayud <i>et al.</i> 2011b; Edwards <i>et al.</i> 1994; Gerosa <i>et al.</i> 2009; Samuelson <i>et al.</i> 1996; Weinstein <i>et al.</i> 1998
<i>Q. serrata</i> J.A. Mur.	Fagaceae	Tree	Deciduous	Yes	Watanabe <i>et al.</i> 2007
<b>Ranunculus</b>					
<i>R. acris</i> L.	Ranunculaceae	Forb	Perennial	Yes/No	Hayes <i>et al.</i> 2006 (No); Wagg <i>et al.</i> 2013 (Yes)
<i>R. spp.</i>	Ranunculaceae	Forb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Rhamnus</b>					
<i>R. cathartica</i> L.	Rhamnaceae	Tree / Shrub	Deciduous	Yes	Benham <i>et al.</i> 2010; VanderHeyden <i>et al.</i> 2001; Zhang <i>et al.</i> 2001
<b>Rhus</b>					
<i>R. copallinum</i> L.	Anacardiaceae	Tree	Deciduous	Yes	Davis and Orendovici, 2006; Orendovici <i>et al.</i> 2003
<i>R. trilobata</i> Nutt.	Anacardiaceae	Shrub		Yes	Temple, 1989
<b>Ribes</b>					
<i>R. alpinum</i> L.	Grossulariaceae	Shrub	Deciduous	Yes	Novak <i>et al.</i> 2003
<i>R. hudsonianum</i> Richards.	Grossulariaceae	Shrub		Yes	Treshow and Stewart, 1973
<b>Robinia</b>					
<i>R. pseudoacacia</i> L.	Fabaceae	Tree		Yes	Benham <i>et al.</i> 2010; Bussotti and Ferretti, 2009; Vollenweider <i>et al.</i> 2003b
<b>Rosa</b>					
<i>R. canina</i> L.	Rosaceae	Shrub	Deciduous	Yes	Bussotti and Ferretti, 2009
<i>R. woodsii</i> Lindl.	Rosaceae	Shrub	Deciduous	Yes	Treshow and Stewart, 1973
<b>Rubia</b>					
<i>R. peregrina</i> L.	Rubiaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Rubus</b>					
<i>R. fruticosus</i> Aggr.	Rosaceae		Perennial	Yes	Vollenweider <i>et al.</i> 2003b

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>R. sp.</i>	Rosaceae			Yes	Bussotti and Ferretti, 2009
<b>Rudbeckia</b>					
<i>R. laciniata</i> L.	Asteraceae	Herb	Perennial	Yes	Burkey <i>et al.</i> 2006; Chappelka <i>et al.</i> 2003; Davison <i>et al.</i> 2003; Szantoi <i>et al.</i> 2009
<i>R. occidentalis</i> Nutt.	Asteraceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Rumex</b>					
<i>R. acetosa</i> L.	Polygonaceae	Forb	Perennial	No	Hayes <i>et al.</i> 2006
<i>R. acetosa</i> L.	Polygonaceae	Forb	Perennial	Yes	Scebba <i>et al.</i> 2006a; Manning and Godzik, 2004; Skelly <i>et al.</i> 1998
<i>R. crispus</i> L.	Polygonaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>R. obtusifolius</i> L.	Polygonaceae	Weed	Perennial	Yes	Nussbaum <i>et al.</i> 2001; Scebba <i>et al.</i> 2006a; VanderHeyden <i>et al.</i> 2001
<i>R. sanguineus</i> L.	Polygonaceae		Perennial	Yes	Skelly <i>et al.</i> 1998
<i>R. sp. L.</i>	Polygonaceae	Herb	Annual or biennial or perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Salix</b>					
<i>S. alba</i> L.	Salicaceae	Tree	Deciduous	Yes	Novak <i>et al.</i> 2003
<i>S. gooddingii</i> C.R.Ball.	Salicaceae	Tree		Yes	Temple, 1989
<i>S. viminalis</i> L.	Salicaceae	Shrub		Yes	VanderHeyden <i>et al.</i> 2001
<b>Salvia</b>					
<i>S. pratensis</i> L.	Lamiaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Sambucus</b>					
<i>S. ebulus</i> L.	Adoxaceae	Herb		Yes	Orendovici <i>et al.</i> 2003
<i>S. melanocarpa</i> A.Gray	Caprifoliaceae	Shrub	Deciduous	Yes	Treshow and Stewart, 1973
<i>S. nigra</i> L.	Adoxaceae	Tree / Shrub	Deciduous	Yes	Benham <i>et al.</i> 2010; Orendovici <i>et al.</i> 2003
<i>S. racemosa</i> L.	Adoxaceae	Shrub		Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002; VanderHeyden <i>et al.</i> 2001
<b>Sanguisorba</b>					
<i>S. minor</i> Scop.	Rosaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009
<b>Saxifraga</b>					
<i>S. arguta</i> D. Don	Saxifragaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>S. stellaris</i> (L.) or <i>Micranthes stellaris</i> (L.) Galasso, Banfi et Soldano	Saxifragaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Schima</b>					
<i>S. superba</i> Gardner. et Champion.	Theaceae	Tree	Evergreen	Yes	Zhang <i>et al.</i> 2012
<b>Scirpus</b>					
<i>S. cespitosus</i> L.	Cyperaceae	Forb		Yes	Hayes <i>et al.</i> 2006
<b>Senecio</b>					
<i>S. fluviatilis</i> Wallr. or <i>S. ovatus</i> (G. Gaertn. et Al.) Willd.	Asteraceae	Forb		No	Hayes <i>et al.</i> 2006
<i>S. subalpinus</i> Koch.	Asteraceae	Forb	Perennial	Yes	Manning and Godzik, 2004
<i>S. serra</i> Hook.	Asteraceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>S. vulgaris</i> L.	Asteraceae	Forb		Yes	El-Khatib, 2003
<b>Silphium</b>					
<i>S. perfoliatum</i> L.	Asteraceae	Herb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Sonchus</b>					
<i>S. oleraceus</i> L.	Asteraceae			Yes	El-Khatib, 2003
<b>Sorbus</b>					
<i>S. aria</i> Crantz.	Rosaceae	Tree	Deciduous	Yes	Vollenweider <i>et al.</i> 2003b
<i>S. aucuparia</i> L.	Rosaceae	Tree / Shrub	Deciduous	Yes/No	Gunthardt-Goerg <i>et al.</i> 2000 (Yes); Manning and Godzik, 2004 (Yes); Manning <i>et al.</i> 2002 (Yes); Orendovici <i>et al.</i> 2003 (No)
<b>Spartina</b>					
<i>S. alterniflora</i> Loisel.	Poaceae	Grass	Perennial (Deciduous)	Yes	Taylor <i>et al.</i> 2002
<b>Sphagnum</b>					
<i>S. papillosum</i> Lindb.	Sphagnaceae	Moss		No	Mörsky <i>et al.</i> 2011
<b>Spiraea</b>					
<i>S. spp.</i>	Rosaceae	Shrub	Deciduous	Yes	Skelly <i>et al.</i> 1998
<b>Stachys</b>					
<i>S. officinalis</i> (L.) Trevis. ex Briq.	Lamiaceae	Forb (grassland)	Perennial	Yes	Manning and Godzik, 2004; Manning <i>et al.</i> 2002
<i>S. spp.</i>	Lamiaceae	Shrub / Herb	Annual or perennial	Yes	Bussotti and Ferretti, 2009
<b>Succisa</b>					
<i>S. pratensis</i> Moench.	Dipsacaceae		Perennial	Yes	Franzaring <i>et al.</i> 2000
<b>Symphoricarpos</b>					
<i>S. vaccinioides</i> Rydb.	Caprifoliaceae	Shrub	Deciduous	Yes	Treshow and Stewart, 1973
<b>Taraxacum</b>					



Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>T. officinale</i> F.H. Wigg.	Asteraceae	Forb	Perennial	Yes	Bussotti and Ferretti, 2009 Treshow and Stewart, 1973
<b>Teucrium</b>					
<i>T. scorodonia</i> L.	Lamiaceae	Herb	Perennial	Yes	Orendovici <i>et al.</i> 2003
<b>Thalictrum</b>					
<i>T. endleri</i> Engelm.	Ranunculaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Thymus</b>					
<i>T. polytrichus</i> A. Kern. ex Borbas	Lamiaceae	Forb		No	Hayes <i>et al.</i> 2006
<b>Tibouchina</b>					
<i>T. pulchra</i> (Cham.) Cogn.	Melastomataceae	Tree		Yes	Furlan <i>et al.</i> 2008; Moraes <i>et al.</i> 2003
<b>Tilia</b>					
<i>T. cordata</i> Miller.	Malvaceae	Tree	Deciduous	Yes	Novak <i>et al.</i> 2003
<i>T. platyphyllos</i> Scop.	Malvaceae	Tree	Deciduous	Yes	Novak <i>et al.</i> 2003
<b>Toxicodendron</b>					
<i>T. radicans</i> (L.) Kuntze.	Anacardiaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Tradescantia</b>					
<i>T. pallida</i> (Rose.) Hunt.	Commelinaceae		Perennial + Evergreen	Yes	de Souza Lima <i>et al.</i> 2009
<b>Trifolium</b>					
<i>T. angustifolium</i> L.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>T. cherleri</i> L.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>T. ciliolatum</i> Benth.	Fabaceae	Herb	Annual	No	Pfleeger <i>et al.</i> 2010
<i>T. glomeratum</i> L.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>T. hirtum</i> All.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>T. hybridum</i> L.	Fabaceae	Herb	Perennial	Yes	Pfleeger <i>et al.</i> 2010
<i>T. microcephalum</i> Pursh.	Fabaceae	Herb	Annual	No	Pfleeger <i>et al.</i> 2010
<i>T. pratense</i> L.	Fabaceae	Herb	Perennial	Yes	Bussotti and Ferretti, 2009; Nussbaum <i>et al.</i> 2001; Scebba <i>et al.</i> 2006a
<i>T. repens</i> L.	Fabaceae			Yes	Hayes <i>et al.</i> 2009; Scebba <i>et al.</i> 2006a; Tang <i>et al.</i> 1999
<i>T. striatum</i> L.	Fabaceae			Yes	Bermejo <i>et al.</i> 2003
<i>T. subterraneum</i> L.	Fabaceae		Annual	Yes	Bermejo <i>et al.</i> 2003; Sanz <i>et al.</i> 2005; Vollsnes <i>et al.</i> 2010
<b>Trisetum</b>					
<i>T. flavescens</i> (L.) P. Beauv.	Poaceae	Grass	Perennial	Yes	Nussbaum <i>et al.</i> 2001
<b>Tristania</b>					
<i>T. conferta</i> (R. Br.) Steud. or <i>Lophostemon confertus</i> (R.Br.) P.G. Wilson et J.T. Waterh.	Myrtaceae	Tree		Yes	O'Connor <i>et al.</i> 1975

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<b>Tsuga</b>					
<i>T. canadensis</i> (L.) Carriere.	Pinaceae	Tree	Coniferous	No	Neufeld <i>et al.</i> 2000
<b>Ulmus</b>					
<i>U. minor</i> Mill.	Ulmaceae	Tree		Yes	Orendovici <i>et al.</i> 2003
<b>Urtica</b>					
<i>U. gracilis</i> Alton. or <i>U. dioica</i> ssp. <i>gracilis</i> (Alton.) Selander.	Urticaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<b>Vaccinium</b>					
<i>V. myrtillus</i> L.	Ericaceae	Shrub		Yes	Bussotti and Ferretti, 2009; Manning <i>et al.</i> 2002
<b>Verbesina</b>					
<i>V. occidentalis</i> Walt.	Asteraceae	Herb	Perennial	Yes	Burkey <i>et al.</i> 2006; Chappelka <i>et al.</i> 2003
<b>Vernonia</b>					
<i>V. noveboracensis</i> Wild.	Asteraceae	Herb		Yes	Orendovici <i>et al.</i> 2003
<b>Veronica</b>					
<i>V. anagallis-aquatica</i> L.	Plantaginaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>V. chamaedrys</i> L.	Plantaginaceae	Herbs	Perennial	Yes	Scebba <i>et al.</i> 2006a; 2006b
<i>V. spp.</i>	Plantaginaceae	Herb / Shrub / Small tree	Annual / perennial	Yes	Bussotti and Ferretti, 2009
<b>Viburnum</b>					
<i>V. lantana</i> L.	Adoxaceae	Shrub	Deciduous	Yes	Benham <i>et al.</i> 2010; Bussotti and Ferretti, 2009; Novak <i>et al.</i> 2003, 2005, 2008; Orendovici <i>et al.</i> 2003; Skelly <i>et al.</i> 1998; VanderHeyden <i>et al.</i> 2001; Vollenweider <i>et al.</i> 2003b; Zhang <i>et al.</i> 2001
<i>V. lentago</i> L.	Adoxaceae	Tree / Shrub		Yes	Orendovici <i>et al.</i> 2003
<i>V. opulus</i> L.	Adoxaceae	Shrub	Deciduous	Yes	Benham <i>et al.</i> 2010; Manning <i>et al.</i> 2002; Novak <i>et al.</i> 2003
<i>V. tinus</i> L.	Adoxaceae	Shrub	Evergreen	No	Orendovici <i>et al.</i> 2003
<b>Vicia</b>					
<i>V. americana</i> Muhl. ex Willd.	Fabaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973
<i>V. tetrasperma</i> (L.) Moench.	Fabaceae	Herb	Annual	No	Pfleeger <i>et al.</i> 2010
<b>Viola</b>					
<i>V. adunca</i> Sm.	Violaceae	Forb	Perennial	Yes	Treshow and Stewart, 1973

Taxon		Type	Sub-Type	Affected	Reference
Genus & Species	Family				
<i>V. lutea</i> Huds.	Violaceae	Forb		No	Hayes et al. 2006
<i>V. reichenbachiana</i> Jord. ex Boreau.	Violaceae	Herb	Perennial	Yes	Fangmeier, 1989
<b>Vitis</b>					
<i>V. vinifera</i> L.	Vitaceae			Yes	Bussotti and Ferretti, 2009; Davis and Orendovici, 2006 ( <i>V. spp.</i> )
<b>Vulpia</b>					
<i>V. ciliata</i> L. Dumont.	Poaceae	Herb		Yes	Scebba et al. 2006a
<i>V. myuros</i> L. Gmelin.	Poaceae	Grass	Annual	No	Scebba et al. 2006a
<b>Zelkova</b>					
<i>Z. serrata</i> (Thunb.) Makino.	Ulmaceae	Tree		Yes	Hoshika et al. 2012c

Table 2. Species reported that have developed ozone-like (but not confirmed) symptoms. The most of them have been observed in naturally grown plants (under open-field conditions) where the influence of other factors (such as other pollutants, nutrient deficiency, etc.) cannot be excluded

Taxon		Type	Sub-Type	Foliar Visible Injury	Reference
Genus & Species	Family				
<b>Chaerophyllum</b>					
<i>C. aromaticum</i> L.	Apiaceae	Forb	Perennial	Yes	Manning et al. 2002
<b>Cornus</b>					
<i>C. sanguinea</i> L.	Cornaceae	Shrub	Deciduous	Yes	Manning et al. 2002
<b>Geranium</b>					
<i>G. palustre</i> L.	Geraniaceae	Forb	Perennial	Yes	Manning et al. 2002
<b>Lapsana</b>					
<i>L. communis</i> L.	Asteraceae	Forb	Annual	Yes	Manning et al. 2002
<b>Ligustrum</b>					
<i>L. vulgare</i> L.	Oleaceae			Yes	Benham et al. 2010
<b>Lonicera</b>					
<i>L. nigra</i> L.	Caprifoliaceae	Shrub		Yes	Manning et al. 2002
<b>Pinus</b>					
<i>P. koraiensis</i> Sieb. et Zucc.	Pinaceae	Tree		Yes	Choi et al. 2006
<i>P. rigida</i> Miller.	Pinaceae	Tree		Yes	Choi et al. 2006
<b>Populus</b>					
<i>P. tremula</i> L.	Salicaceae	Tree		Yes	Benham et al. 2010
<b>Prunus</b>					
<i>P. mahaleb</i> L.	Rosaceae	Tree		Yes	Benham et al. 2010
<b>Salix</b>					
<i>S. caprea</i> L.	Salicaceae	Shrub	Deciduous	Yes	Manning et al. 2002
<i>S. daphnoides</i> Vill.	Salicaceae			Yes	Benham et al.

Taxon		Type	Sub-Type	Foliar Visible Injury	Reference
Genus & Species	Family				
					2010
<b>Sassafras</b>					
<i>S. albidum</i> (Nutt.) Nees.	Lauraceae	Tree	Deciduous	Yes	Davis and Orendovici, 2006
<b>Thymus</b>					
<i>T. alpestris</i> A. Kern.	Lamiaceae	Forb	Perennial	Yes	Manning <i>et al.</i> 2002
<b>Ulmus</b>					
<i>U. excelsior</i> L.	Ulmaceae	Tree		Yes	Manning <i>et al.</i> 2002
<i>U. glabra</i> Huds.	Ulmaceae	Tree		Yes	Benham <i>et al.</i> 2010
<i>U. laevis</i> Pall.	Ulmaceae	Tree		Yes	Manning <i>et al.</i> 2002
<i>U. montana</i> Stokes, Sm., Loudon, Mathieu, With or <i>U. glabra</i> Huds.	Ulmaceae	Tree		Yes	Manning <i>et al.</i> 2002
<b>Vincetoxicum</b>					
<i>V. officinale</i> Moench. or <i>Cynanchum vincetoxicum</i> (L.) Pers.	Apocynaceae	Forb	Perennial	Yes	Manning <i>et al.</i> 2002

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