

Target weed species in South Africa, their region of origin, and degree of biological control achieved, where applicable (see below for definitions): natural enemies studied, their feeding guilds or association with the host plant, year of release, establishment and degree of agent damage to the weed (if established) (see below for definitions)

Target weed, region of origin, and degree of control	Natural enemy	Feeding guild	Agent status	Damage inflicted
ARACEAE				
<i>Pistia stratiotes</i> L. (water lettuce) South America Complete	<i>Neohydronomus affinis</i> Hustache (Coleoptera: Curculionidae)	Leaf and stem borer	Released 1985, established	Extensive
ASTERACEAE				
<i>Ageratina adenophora</i> (Spreng.) R.M.King & H.Rob. (formerly in <i>Eupatorium</i>) (Crofton weed) Central America Negligible	<i>Passalora ageratinae</i> Crous & A.R. Wood (=“ <i>Phaeoramularia</i> ” sp.) (anamorphic fungus; Mycosphaerellales: Mycosphaerellaceae)	Leaf spot pathogen	Released 1987, established	Moderate
	<i>Procecidochares utilis</i> Stone (Diptera: Tephritidae)	Stem galler	Released 1984, established	Moderate
<i>Ageratina riparia</i> (Regel) R.M.King & H.Rob. (formerly in <i>Eupatorium</i>) (mistflower) Central America Complete	<i>Entyloma ageratinae</i> R.W. Barreto & H.C. Evans (Entylomatales: Entylomataceae)	Leaf pathogen	Released 1989, established	Considerable
<i>Campuloclinium macrocephalum</i> (Less.) DC. [formerly in <i>Eupatorium</i>] (pompom weed) South America Not determined	<i>Puccinia eupatorii</i> Dietel (Pucciniales: Pucciniaceae)	Leaf rust pathogen	Not released, occurs locally; also under investigation	Unknown
	<i>Liothrips tractabilis</i> Mound & Pereyra (Thysanoptera: Thripidae)	Stem- & leaf-deformer	Released 2013, established	Moderate
<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob. [formerly in <i>Eupatorium</i>] (triffid weed) North, Central & South America Not determined	<i>Calycomyza eupatorivora</i> Spencer (Diptera: Agromyzidae)	Leaf miner	Released 2003, established	Negligible
	<i>Dichrorampha odorata</i> Brown & Zachariades (Lepidoptera: Tortricidae)	Stem-tip galler	Released 2013, establishment unconfirmed	
	<i>Lixus aemulus</i> Petri (Coleoptera: Curculionidae)	Stem borer	Released 2011, establishment unconfirmed	
	<i>Pareuchaetes aurata</i> (Butler) (Lepidoptera: Arctiidae)	Leaf feeder	Released 1990, not established	
	<i>Pareuchaetes insulata</i> (Walker) (Lepidoptera: Arctiidae)	Leaf feeder	Released 2001, established	Considerable
	<i>Pareuchaetes pseudoinsulata</i> Rego Barros (Lepidoptera: Arctiidae)	Leaf feeder	Released 1989 & 1998, not established	
<i>Cirsium vulgare</i> (Savi) Ten. (spear thistle) Europe Negligible	<i>Rhinocyllus conicus</i> (Froelich) (Coleoptera: Curculionidae)	Seed feeder	Released 1984-1986, established	Moderate
	<i>Urophora stylata</i> (Fabricius) (Diptera: Tephritidae)	Seed feeder	Released 1984-1990, not established	
<i>Parthenium hysterophorus</i> L. (parthenium) Gulf of Mexico & South America Negligible	<i>Listronotus setosipennis</i> (Hustache) (Coleoptera: Curculionidae)	Stem borer	Released 2013, established	Unknown
	<i>Puccinia abrupta</i> Dietel & Holw. var. <i>partheniicola</i> (H.S. Jacks.) Parmelee (Pucciniales: Pucciniaceae)	Leaf rust pathogen	Not released, occurs locally	Unknown
	<i>Puccinia xanthii</i> Schwein. var. <i>parthenii-hysterophorae</i> Seier, H.C. Evans & Á. Romero	Leaf rust pathogen	Released 2010, established	Unknown

	(= <i>P.melampodii</i> ; Pucciniales: Pucciniaceae)			
	<i>Smicronyx lutulentus</i> Dietz (Coleoptera: Curculionidae)	Seed feeder	Released 2015, establishment unconfirmed	Unknown
	<i>Zygogramma bicolorata</i> Pallister (Coleoptera: Chrysomelidae: Cassidinae)	Leaf feeder	Released 2013, established	Unknown
<i>Tithonia rotundifolia</i> (Mill.) S.F.Blake (red sunflower) Central America	<i>Zygogramma piceicollis</i> (Stål) (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 2015, establishment unconfirmed	Unknown
	<i>Zygogramma signatipennis</i> (Stål) (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 2015, establishment unconfirmed	Unknown
<i>Silybum marianum</i> (L.) Gaertn. (milk thistle) Mediterranean, Asia	<i>Rhinocyllus conicus</i> (Froelich) (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 1985, not established	
AZOLLACEAE				
<i>Azolla filiculoides</i> Lam. (red water fern) South America Complete	<i>Stenopelmus rufinatus</i> Gyllenhal (Coleoptera: Curculionidae)	Frond feeder	Released 1997, established	Extensive
BIGNONIACEAE				
<i>Dolichandra unguis-cati</i> (L.) Lohman [syn: <i>Macfadyena unguis-cati</i> (L.) A.H.Gentry] (cat's claw creeper) Central & South America Negligible	<i>Carvalhotingis hollandi</i> Drake (Hemiptera: Tingidae)	Leaf sucker	Released 2007, established	Trivial
	<i>Carvalhotingis visenda</i> Drake & Hambleton (Hemiptera: Tingidae)	Leaf sucker	Released 2007, established	Moderate
	<i>Charidotis auroguttata</i> Boheman (Coleoptera: Chrysomelidae: Cassidinae)	Leaf feeder	Released 1999, established	Trivial
	<i>Hedwigiella jureceki</i> (Obenberger) (Coleoptera: Buprestidae)	Leaf miner	Released 2007, established	Trivial
	<i>Hypocosmia pyrochroma</i> Jones (Lepidoptera: Pyralidae)	Leaf feeder	Released 2010, establishment unconfirmed	Unknown
<i>Tecoma stans</i> (L.) Juss ex Kunth var. <i>stans</i> (yellow bells) North & Central America Not determined	<i>Mada polluta</i> (Mulsant) (Coleoptera: Coccinellidae)	Leaf feeder	Released 2013, established	Unknown
	<i>Prosopidium transformans</i> (Ellis & Everh.) Cummins (Pucciniales: Uropyxidaceae)	Leaf rust pathogen	Released 2010, not established	
	<i>Pseudonapomyza</i> sp. (Diptera: Agromyzidae)	Leaf miner	Released 2014, establishment unconfirmed	
CACTACEAE				
<i>Austrocylindropuntia subulata</i> (Muehlenpf.) Backeb. (= <i>Opuntia exaltata</i> (Berger)) South America Not determined	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, established	Unknown
<i>Cereus jamacaru</i> DC. and <i>C. hildmannianus</i> K.Schum. (queen of the night) South America Complete	<i>Hypogeococcus festerianus</i> (Lizer y Trelles) (Hemiptera: Pseudococcidae)	Stem sucker	Alternative host, established	Extensive
	<i>Nealcidion cereicola</i> (Fisher) [formerly in <i>Alcidion</i>] (Coleoptera: Cerambycidae)	Stem borer	Alternative host, released 1990, established	Considerable
<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth var. <i>fulgida</i> (chain-fruit cholla)	<i>Dactylopius tomentosus</i> (Lamarck), 'cholla' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Released 2008, established	Extensive

North & Central America Complete	<i>Dactylopius tomentosus</i> (Lamarck), 'imbricata' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, released 1970, established	Trivial
<i>Cylindropuntia fulgida</i> (Engelm.) F.M.Knuth var. <i>mamillata</i> (Boxing-glove cactus) North & Central America Complete	<i>Dactylopius tomentosus</i> (Lamarck), 'cholla' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, released 2012, established	Extensive
<i>Cylindropuntia imbricata</i> (Haw.) F.M.Knuth (imbricate prickly pear) North & Central America Substantial	<i>Dactylopius tomentosus</i> (Lamarck), 'imbricata' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Released 1970, established	Considerable
	<i>Metamasius spinolae</i> (Gyllenhal) (Coleoptera: Curculionidae)	Stem borer	Alternative host, released 1974, not established	
<i>Cylindropuntia leptocaulis</i> (DC.) F.M.Knuth (pencil cactus) North & Central America Complete	<i>Dactylopius tomentosus</i> (Lamarck), 'imbricata' biotype, (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, released 1977, established	Extensive
<i>Harrisia balansae</i> (K.Schum.) N.P.Taylor & Zappi South America Substantial	<i>Hypogeococcus festerianus</i> (Lizer y Trelles) (Hemiptera: Pseudococcidae)	Stem sucker	Alternative host, released 2006, established	Considerable
<i>Harrisia martinii</i> (Labour.) Britton & Rose (harrisia/ moon cactus) South America Complete	<i>Hypogeococcus festerianus</i> (Lizer y Trelles) (Hemiptera: Pseudococcidae)	Stem sucker	Released 1983, established	Extensive
	<i>Nealcidion cereicola</i> (Fisher) [formerly in <i>Alcidion</i>] (Coleoptera: Cerambycidae)	Stem borer	Released 1990, established	Considerable
<i>Harrisia pomanensis</i> (F.A.C.Weber) Britton & Rose (midnight lady, devil's rope cactus) South America Not determined	<i>Hypogeococcus festerianus</i> (Lizer y Trelles) (Hemiptera: Pseudococcidae)	Stem sucker	Alternative host, established	Moderate
<i>Harrisia tortuosa</i> (J.Forbes ex Otto & A.Dietr.) Britton & Rose (spiny snake cactus) South America Not determined	<i>Hypogeococcus festerianus</i> (Lizer y Trelles) (Hemiptera: Pseudococcidae)	Stem sucker	Alternative host, released 2014, established	Unknown
<i>Opuntia aurantiaca</i> Lindl. (jointed cactus) South America Substantial	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, established	Moderate
	<i>Dactylopius austrinus</i> De Lotto (Hemiptera: Dactylopiidae)	Cladode sucker	Released 1935, established	Extensive
	<i>Mimorista pulchellalis</i> Dyar (Lepidoptera: Crambidae)	Cladode borer	Released 1979, not established	
	<i>Nanaia</i> sp. (Lepidoptera: Pyralidae)	Cladode borer	Released 1983, not established	
	<i>Zophodia tapiacola</i> (Dyar) [formerly in <i>Tucumania</i>] (Lepidoptera: Pyralidae)	Cladode borer	Released 1976 & 1982, not established	
<i>Opuntia engelmannii</i> Salm- Dyck ex Engelm. (=O. <i>lindheimeri</i> , O. <i>tardospina</i>) (small round-leaved prickly pear) North & Central America Negligible	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, released 1938, established	Trivial on large plants, moderate on small plants
	<i>Dactylopius opuntiae</i> (Cockerell), 'ficus' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, released 1938, established	Moderate to trivial, depending on climate & plant variety

	<i>Dactylopius opuntiae</i> (Cockerell), Australian ('stricta') biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, released 2013, established	Considerable
<i>Opuntia ficus-indica</i> (L.) Mill. (mission prickly pear) Central America Substantial	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Released 1933, established	Extensive
	<i>Dactylopius opuntiae</i> (Cockerell), 'ficus' biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Released 1938, established	Extensive
	<i>Lagocheirus funestus</i> (Thompson) [formerly in <i>Archlagocheirus</i>] (Coleoptera: Cerambycidae)	Stem borer	Released 1943, established	Trivial
	<i>Metamasius spinolae</i> (Gyllenhal) (Coleoptera: Curculionidae)	Stem borer	Released 1948, established	Extensive
<i>Opuntia humifusa</i> (Raf.) Raf. (creeping prickly pear, large-flowered prickly pear) North America Not determined	<i>Dactylopius opuntiae</i> (Cockerell), Australian ('stricta') biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Alternative host, established	Considerable in hot, arid regions, moderate in cooler regions and Highveld
<i>Opuntia monacantha</i> Haw. (smooth/ drooping prickly pear) South America Substantial	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, established	Considerable
	<i>Dactylopius ceylonicus</i> (Green) (Hemiptera: Dactylopiidae)	Cladode sucker	Released 1913, established	Extensive
<i>Opuntia salmiana</i> J.Parm. ex Pfeiff. South America Substantial	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, established	Considerable
<i>Opuntia spinulifera</i> Salm-Dyck (large round-leaved prickly pear) Central America Not determined	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, established	Unknown
<i>Opuntia stricta</i> (Haw.) Haw. (Australian pest pear) North America & Caribbean Substantial	<i>Cactoblastis cactorum</i> (Berg) (Lepidoptera: Pyralidae)	Cladode borer	Alternative host, released 1980s, established	Extensive
	<i>Dactylopius opuntiae</i> (Cockerell), Australian ('stricta') biotype (Hemiptera: Dactylopiidae)	Cladode sucker	Released 1997, established	Extensive
<i>Pereskia aculeata</i> Mill. (Barbados gooseberry/ pereskia) South America & Caribbean Negligible	<i>Catorhintha schaffneri</i> Brailovsky & Garcia (Hemiptera: Coreidae)	Stem wilter	Released 2014, established	Unknown
	<i>Phenrica guerini</i> Bechyné (Coleoptera: Chrysomelidae)	Leaf feeder	Released 1991 & 1995, established	Trivial
CLUSIACEAE				
<i>Hypericum perforatum</i> L. (St John's wort) Europe & Asia Complete	<i>Agrilus (Spiragrilus) hyperici</i> (Creutzer) (Coleoptera: Buprestidae)	Root borer	Released 1974-1979, not established	
	<i>Aplocera efformata</i> (Guenée) (Lepidoptera: Geometridae)	Leaf feeder	Released 1983, not established	
	<i>Aphis chloris</i> Koch (Hemiptera: Aphididae)	Sap sucker	Released 1982, not established	
	<i>Chrysolina hyperici</i> (Forster) (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 1960-1973, not established	
	<i>Chrysolina quadrigemina</i> Suffrian (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 1960-1973, established	Extensive
	<i>Zeuxidiplosis giardi</i> (Kieffer) (Diptera: Cecidomyiidae)	Shoot-tip galler	Released 1972, established	Moderate

FABACEAE				
Caesalpinia decapetala (Roth) Alston (Mauritius thorn) Asia Negligible	<i>Sulcobruchus subsuturalis</i> (Pic) (= <i>S. bakeri</i> Kingsolver) (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Released 1999, established	Trivial
Gleditsia triacanthos L. (honey locust) North America Not determined	<i>Megabruchidius tonkineus</i> (Pic) (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Not released, occurs locally	Unknown
Leucaena leucocephala (Lam.) de Wit (leucaena) Tropical America Negligible	<i>Acanthoscelides macrophthalmus</i> (Schaeffer) (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Released 1999, established	Trivial
Prosopis L. species (mesquite/ prosopis) North & Central America Negligible	<i>Algarobius bottimeri</i> Kingsolver (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Released 1990, not established	
	<i>Algarobius prosopis</i> (LeConte) (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Released 1987, established	Considerable
	<i>Neltumius arizonensis</i> (Schaeffer) (Coleoptera: Chrysomelidae: Bruchinae)	Seed feeder	Released 1993, established	Trivial
Sesbania punicea (Cav.) Benth. (red sesbania) South America Complete	<i>Neodiplogrammus quadrivittatus</i> (Olivier) (Coleoptera: Curculionidae)	Stem borer	Released 1984, established	Extensive
	<i>Rhysomatus marginatus</i> Fåhræus (Coleoptera: Curculionidae)	Seed feeder	Released 1984, established	Extensive
	<i>Trichapion lativentre</i> (Béguin-Billecocq) (Coleoptera: Brentidae: Apioninae)	Flowerbud feeder	Released 1970s, established, present before release	Extensive
HALORAGACEAE				
Myriophyllum aquaticum (Vell.) Verdc. (parrot's feather) South America Complete	<i>Lysathia</i> sp. (Coleoptera: Chrysomelidae)	Leaf feeder	Released 1994, established	Extensive
	<i>Xanthomonas campestris</i> (Pammel) Dawson (?) (Proteobacteria: Xanthomonadales: Xanthomonadaceae)	Bacterial wilt	Not released, occurs locally; rejected	
HYDROCHARITACEAE				
Hydrilla verticillata (L.f.) Royle (hydrilla) Old World	<i>Hydrellia</i> sp. (Diptera: Ephydriidae)	Leaf miner	Release permit issued	
MIMOSACEAE				
Acacia baileyana F.Muell. (Bailey's wattle) Australia Negligible	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 2006 & 2009, established	Moderate
Acacia cyclops A.Cunn. ex G.Don (red eye/ rooikrans) Australia Substantial	<i>Calonectria scoparia</i> Ribeiro & Matsuoka ex Peerally (Hypocreales: Nectriaceae) (anamorphic fungus: <i>Cylindrocladium candelabrum</i>)	Leaf spot pathogen	Not released, occurs locally; rejected	
	<i>Dasineura dielsi</i> Rübsaamen (Diptera: Cecidomyiidae)	Flower galler	Released 2002, established	Extensive
	<i>Melanterius servulus</i> Pascoe (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 1991 & 1994, established	Considerable
	<i>Pseudolagarobasidium acaciicola</i> Ginns (Polyporales: Phanerochaetaceae)	Die-back pathogen	Not released, occurs locally; under investigation	Unknown

<i>Acacia dealbata</i> Link (silver wattle) Australia Negligible	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 1994-2007, established	Moderate
<i>Acacia decurrens</i> (Wendl.) Willd. (green wattle) Australia Negligible	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 2001-2007, established	Moderate
<i>Acacia longifolia</i> (Andr.) Willd. (long-leaved wattle) Australia Substantial	<i>Melanterius ventralis</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Released 1985, established	Extensive
	<i>Trichilogaster acaciaelongifoliae</i> (Froggatt) (Hymenoptera: Pteromalidae)	Bud galler	Released 1982, established	Extensive
<i>Acacia mearnsii</i> De Wild. (black wattle) Australia Negligible	<i>Ceratocystis albofundus</i> M.J.Wingf., De Beer & M.J.Morris (Microascales: Ceratocystidaceae)	Gummosis pathogen	Not released, occurs locally; shelved	
	<i>Cylindrobasidium laeve</i> (Pers.) Chamuris (Polyporales: Physalacriaceae)	Early succession wood rot pathogen, prevents coppice growth	Not released, occurs locally; developed as cut stump inoculant "Stumpout"	
	<i>Dasineura rubiformis</i> Kolesik (Diptera: Cecidomyiidae)	Flower galler	Present before release, established	Extensive in Western Cape
	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Released 1993-1996, established	Moderate
<i>Acacia melanoxylon</i> R.Br. (Australian blackwood) Australia Substantial	<i>Melanterius acaciae</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Released 1986, established	Extensive
<i>Acacia podalyriifolia</i> A.Cunn. ex G.Don (pearl acacia) Australia Not determined	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 2008, established	Moderate but localised
<i>Acacia pycnantha</i> Benth. (golden wattle) Australia Substantial	<i>Cylindrobasidium laeve</i> (Pers.) Chamuris (Polyporales: Physalacriaceae)	Early succession wood rot fungus	Alternative host; not released, occurs locally; developed as cut stump inoculant "Stumpout", but never used	
	<i>Melanterius maculatus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Alternative host, released 2005-2007, established	Moderate
	<i>Trichilogaster signiventris</i> (Girault) (Hymenoptera: Pteromalidae)	Bud galler	Released 1987 & 1992, established	Considerable / Extensive
<i>Acacia saligna</i> (Labill.) H.L.Wendl. (Port Jackson willow) Australia Substantial	<i>Melanterius compactus</i> Lea (Coleoptera: Curculionidae)	Seed feeder	Released 2001 & 2003, established	Considerable
	<i>Uromycladium tepperianum</i> (Sacc.) McAlpine (Pucciniales: Pileolariaceae)	Gall former	Released 1987, established	Extensive
<i>Paraserianthes lophantha</i> (Willd.) Nielsen [formerly in <i>Albizia</i>] (stink bean) Australia Substantial	<i>Melanterius servulus</i> Pascoe (Coleoptera: Curculionidae)	Seed feeder	Released 1989, established	Considerable
MYRTACEAE				
<i>Leptospermum laevigatum</i> (Gaertn.) F.Muell. (Australian myrtle)	<i>Aristaea thalassias</i> (Meyrick) [formerly in <i>Parectopa</i>] (Lepidoptera: Gracillariidae)	Leaf feeder	Released 1996, established	Considerable

Australia Negligible	<i>Dasineura strobila</i> Dorchin (Diptera: Cecidomyiidae)	Bud galler	Released 1994, established, present before release	Considerable
PONTEDERIAACEAE				
Eichhornia crassipes (C.Mart.) Solms (water hyacinth) South America Substantial	<i>Acremonium zonatum</i> (Sawada) W.Gams (anamorphic fungus; Hypocreales)	Leaf pathogen	Not released, occurs locally	
	<i>Alternaria eichhorniae</i> Nag-Raj & Ponnappa (anamorphic fungus; Pleosporales: Pleosporaceae)	Leaf pathogen	Not released, occurs locally; shelved	
	<i>Cercospora piaropi</i> Tharp. (anamorphic fungus; Mycosphaerellales: Mycosphaerellaceae)	Leaf pathogen	Not released, occurs locally	
	<i>Cercospora rodmanii</i> Conway (anamorphic fungus; Mycosphaerellales: Mycosphaerellaceae)	Leaf pathogen	Released 1992, established	Considerable
	<i>Cornops aquaticum</i> (Brüner) (Orthoptera: Acrididae: Leptysminae)	Leaf feeder	Released 2011, establishment unconfirmed	
	<i>Eccritotarsus catarinensis</i> (Carvalho) (Hemiptera: Miridae)	Leaf sucker	Released 1996, established	Considerable
	<i>Megamelus scutellaris</i> Berg (Hemiptera: Delphacidae)	Leaf-sucker	Released 2013, established	Unknown
	<i>Neochetina bruchi</i> Hustache (Coleoptera: Curculionidae)	Stem borer	Released 1990 & 1996, established	Considerable
	<i>Neochetina eichhorniae</i> Warner (Coleoptera: Curculionidae)	Stem borer	Released 1974- 1985, established	Considerable
	<i>Niphograptus albiguttalis</i> Warren (Lepidoptera: Crambidae)	Petiole borer	Released 1990, established	Considerable
<i>Orthogalumna terebrantis</i> Wallwork (Acari: Sarcoptiformes: Galumnidae)	Leaf miner	Released 1989, established	Considerable	
PROTEACEAE				
<i>Hakea gibbosa</i> (Sm.) Cav. (rock hakea) Australia Negligible	<i>Aphanasium australe</i> (Boisduval) (Coleoptera: Cerambycidae)	Stem borer	Alternative host, released 2001, established	Unknown
	<i>Erytenna consputa</i> Pascoe (Coleoptera: Curculionidae)	Green-seed feeder	Alternative host, released 1975, established	Trivial
<i>Hakea sericea</i> Schrad. & J.C.Wendl. (silky hakea) Australia Substantial	<i>Aphanasium australe</i> (Boisduval) (Coleoptera: Cerambycidae)	Stem borer	Released 2001, established	Unknown
	<i>Carposina autologa</i> Meyrick (Lepidoptera: Carposinidae)	Seed feeder	Released 1970 & 1982, established	Considerable
	<i>Colletotrichum acutatum</i> J.H. Simmonds f.sp. <i>hakeae</i> Lubbe, Denman, P.F. Cannon, J.Z. Groenew., Lampr. & Crous (Order Incertae sedis: Glomerellaceae)	Stem gummosis disease	Not released, occurs locally; developed as mycoherbicide "Hakatak"	
	<i>Cydmaea binotata</i> Lea (Coleoptera: Curculionidae)	Leaf & shoot borer	Released 1979, established	Trivial
	<i>Dicomada rufa</i> Blackburn (Coleoptera: Curculionidae)	Flowerbud feeder	Released 2006, established	Unknown
	<i>Erytenna consputa</i> Pascoe (Coleoptera: Curculionidae)	Green-seed feeder	Released 1970 & 1974, established	Extensive
SALVINIACEAE				
<i>Salvinia molesta</i> D.S.Mitch. (water fern) South America Complete	<i>Cyrtobagous salviniae</i> Calder & Sands (Coleoptera: Curculionidae)	Stem borer	Released 1985, established	Extensive

SAPINDACEAE				
<i>Cardiospermum grandiflorum</i> Sw. (balloon vine) South America Not determined	<i>Cissoanthonomus tuberculipennis</i> Hustache (Coleoptera: Curculionidae)	Seed feeder	Released 2013, established	Unknown
SOLANACEAE				
<i>Solanum elaeagnifolium</i> Cav. (silverleaf nightshade/satansbos) North, Central & South America Substantial	<i>Frumenta nephelomicta</i> (Meyrick) (Lepidoptera: Gelechiidae)	Fruit galler	Released 1979 & 1985, not established	
	<i>Frumenta</i> sp. (Lepidoptera: Gelechiidae)	Stem & fruit galler	Released 1989, not established	
	<i>Leptinotarsa defecta</i> (Stål) (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 1992, established	Moderate
	<i>Leptinotarsa texana</i> (Schaeffer) (Coleoptera: Chrysomelidae: Chrysomelinae)	Leaf feeder	Released 1992, established	Extensive
<i>Solanum mauritianum</i> Scop. (bugweed) South America Negligible	<i>Anthonomus santacruzi</i> Hustache (Coleoptera: Curculionidae)	Flowerbud feeder	Released 2008, established	Moderate
	<i>Gargaphia decoris</i> Drake (Hemiptera: Tingidae)	Leaf sucker	Released 1999, established	Trivial
<i>Solanum sysimbriifolium</i> Lam. (wild tomato/dense-thorned bitter apple) South America Substantial	<i>Gratiana spadicea</i> (Klug) (Coleoptera: Chrysomelidae: Cassidinae)	Leaf feeder	Released 1994, established	Extensive
VERBENACEAE				
<i>Lantana camara</i> L. (lantana) Central & South America Negligible to Substantial (depending on plant variety)	<i>Aceria lantanae</i> (Cook) (Acari: Trombidiformes: Eriophyidae)	Flower galler	Released 2007, established	Extensive, some vars. Coastal
	<i>Alagoasa parana</i> Samuelson (Coleoptera: Chrysomelidae: Galerucinae)	Leaf miner	Released 1985, not established	
	<i>Autoplusia illustrata</i> (Guenée) (Lepidoptera: Noctuidae)	Leaf feeder	Released 1978 & 1984, not established	
	<i>Calycomyza lantanae</i> (Frick) (Diptera: Agromyzidae)	Leaf miner	Released 1982, established	Moderate
	<i>Coelocephalopion camarae</i> Kissinger (Coleoptera: Brentidae: Apioninae)	Petiole galler	Released 2007, established	Moderate, localised
	<i>Crociosema lantana</i> Busck [formerly in <i>Epinotia</i>] (Lepidoptera: Tortricidae)	Flower- & receptacle miner	Released pre-1961 & 1984, established	Trivial
	<i>Eutreta xanthochaeta</i> Aldrich (Diptera: Tephritidae)	Shoot galler	Released 1983; not established; rejected	
	<i>Falconia intermedia</i> (Distant) (Hemiptera: Miridae)	Leaf sucker	Released 1999, established	Moderate, localized
	<i>Hypena laceratalis</i> Walker (Lepidoptera: Erebidae)	Leaf feeder	Not released, native	Moderate
	<i>Lantanophaga pusillidactyla</i> (Walker) (Lepidoptera: Pterophoridae)	Flower miner	Released pre-1961, established	Trivial
	<i>Leptobyrza decora</i> Drake (Hemiptera: Tingidae)	Leaf sucker	Released 1972-1984, not established	
	<i>Longitarsus bethae</i> Savini & Escalona (Coleoptera: Chrysomelidae: Galerucinae)	Root feeder	Released 2007, established	Considerable

	<i>Neogalia sunia</i> (Guenée) (Lepidoptera: Noctuidae)	Leaf feeder	Released 1962 & 1969, not established	
	<i>Octotoma championi</i> Baly (Coleoptera: Chrysomelidae: Cassidinae)	Leaf miner	Released 1978, not established	
	<i>Octotoma scabripennis</i> Guérin-Mèneville (Coleoptera: Chrysomelidae: Cassidinae)	Leaf miner	Released 1971-1975, established	Considerable
	<i>Ophiomyia camarae</i> Spencer (Diptera: Agromyzidae)	Leaf miner	Released 2001, established	Considerable
	<i>Ophiomyia lantanae</i> (Froggatt) (Diptera: Agromyzidae)	Seed miner	Released pre-1961, established	Moderate
	<i>Orthonama ignifera</i> (Warren) [formerly in <i>Leptostales</i>] (Lepidoptera: Geometridae)	Leaf feeder	Approved for release	
	<i>Passalora lantanae</i> (Chupp) U. Braun & Crous var. <i>lantanae</i> [formerly in <i>Mycovellosiella</i>] (anamorphic fungus; Mycosphaerellales: Mycosphaerellaceae)	Leaf pathogen	Released 2002, not established	
	<i>Puccinia lantanae</i> Farl. (Pucciniales: Puccinaceae)	Leaf- and stem-rust pathogen	Release permit issued	
	<i>Plagiohammus spinipennis</i> (Thomson) (Coleoptera: Cerambycidae)	Stem borer	Released 1973, not established	
	<i>Salbia haemorrhoidalis</i> (Guenée) (Lepidoptera: Crambidae)	Leaf feeder	Released 1962, established	Trivial
	<i>Teleonemia elata</i> Drake (Hemiptera: Tingidae)	Leaf sucker	Released 1972, not established	
	<i>Teleonemia scrupulosa</i> Stål (Hemiptera: Tingidae)	Leaf & flower sucker	Released 1972, established	Considerable
	<i>Uroplata fulvopustulata</i> Baly (Coleoptera: Chrysomelidae: Cassidinae)	Leaf miner	Released 1978, not established	
	<i>Uroplata girardi</i> Pic (Coleoptera: Chrysomelidae: Cassidinae)	Leaf miner	Released 1974 & 1983, established	Considerable in coastal areas
	<i>Uroplata lantanae</i> Buzzi & Winder (Coleoptera: Chrysomelidae: Cassidinae)	Leaf miner	Released 1984, not established	

For each of the agents that has established successfully, a rating is given for the perceived degree of damage that it inflicts on the target weed. These ratings (Anon. 1999), which have been widely adopted since 1999, and slightly amended in this account, are sometimes based on formal measurements and otherwise on subjective visual assessments, and include the following categories. *Extensive*: Very high levels of damage, as much as could be expected from the agent. Few plants survive, or growth is arrested, or almost no seeds are produced. *Considerable*: High levels of damage. Some plants may survive but growth rates are noticeably slower, or seed production is reduced by more than 50%. *Moderate*: Perceivable damage, but most plants survive. Growth may be slowed to some extent, or seed production is reduced by less than 50%. *Trivial*: Some damage, but survival,

growth and seed production of the plants is almost normal. *Unknown*: Agent has been too recently released, or has not been evaluated.

For each weed species, the combined impact of all agents (i.e. the degree of control) (adapted from Anon. 1999) is rated by estimating the degree to which the impact or importance of the target weed species has been reduced by the agents. Assessments are based on the degree of reduction in the use of alternative control methods (chemical or mechanical) since the introduction of biological control agents, and include the following categories. *Complete*: No other control measures are needed to reduce the weed to acceptable levels, at least in areas where the agents are established. *Substantial*: Other methods are needed to reduce the weed to acceptable levels, but less effort is required (e.g. less frequent herbicide applications or less herbicide needed per unit area). *Negligible*: In spite of damage inflicted by the agents, control of the weed remains entirely reliant on the implementation of other control measures. *Not determined*: Either the release of the agents has been too recent for meaningful evaluation, or the programme has not been evaluated.

Adapted from: Klein, H. 2011. A catalogue of the insects, mites and pathogens that have been used or rejected, or are under consideration, for the biological control of invasive alien plants in South Africa. In: Moran, V.C., Hoffmann, J.H. & Hill, M.P. (Eds) Biological Control of Invasive Alien Plants in South Africa (1999-2010). *African Entomology* (Special Issue) **19**(2): 515-549.

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