

Australia/New Zealand Weed Risk Assessment adapted for United States.

Data used for analysis published in: Gordon, D.R. and C.A. Gantz. 2008. Potential impacts on the horticultural industry of screening new plants for invasiveness. Conservation Letters 1: 227-235. Available at: <http://www3.interscience.wiley.com/cgi-bin/fulltext/121448369/PDFSTART>

<i>Cotoneaster submultiflorus</i>			
Question number	Question	Answer	Score
1.01	Is the species highly domesticated?	n	0
1.02	Has the species become naturalised where grown?		
1.03	Does the species have weedy races?		
2.01	Species suited to U.S. climates (USDA hardiness zones; 0-low, 1-intermediate, 2-high)	2	
2.02	Quality of climate match data (0-low; 1-intermediate; 2-high)	2	
2.03	Broad climate suitability (environmental versatility)	y	1
2.04	Native or naturalized in regions with an average of 11-60 inches of annual precipitation	y	1
2.05	Does the species have a history of repeated introductions outside its natural range?	?	
3.01	Naturalized beyond native range	n	-1
3.02	Garden/amenity/disturbance weed	n	0
3.03	Weed of agriculture	n	0
3.04	Environmental weed	n	0
3.05	Congeneric weed	y	2
4.01	Produces spines, thorns or burrs	n	0
4.02	Allelopathic		
4.03	Parasitic	n	0
4.04	Unpalatable to grazing animals		
4.05	Toxic to animals	n	0
4.06	Host for recognised pests and pathogens		
4.07	Causes allergies or is otherwise toxic to humans	n	0
4.08	Creates a fire hazard in natural ecosystems		
4.09	Is a shade tolerant plant at some stage of its life cycle		
4.1	Grows on one or more of the following soil types: alfisols, entisols, or mollisols	y	1
4.11	Climbing or smothering growth habit	n	0
4.12	Forms dense thickets		
5.01	Aquatic	n	0

5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	n	0
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed		
6.03	Hybridizes naturally	?	
6.04	Self-compatible or apomictic	?	
6.05	Requires specialist pollinators		
6.06	Reproduction by vegetative fragmentation		
6.07	Minimum generative time (years)		
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	?	
7.03	Propagules likely to disperse as a produce contaminant	n	-1
7.04	Propagules adapted to wind dispersal	n	-1
7.05	Propagules water dispersed		
7.06	Propagules bird dispersed	y	1
7.07	Propagules dispersed by other animals (externally)	n	-1
7.08	Propagules dispersed by other animals (internally)		
8.01	Prolific seed production		
8.02	Evidence that a persistent propagule bank is formed (>1 yr)		
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
<b>Total Score</b>			<b>2</b>

<b>Outcome</b>	<b>Evaluate</b>
----------------	-----------------

<b>section</b>	<b># questions answered</b>	<b>satisfy minimum?</b>
A	10	Yes
B	6	Yes
C	9	Yes
total	25	yes

Data collected 2008

Question number	Reference	Source data
1.01		used horticulturally, but no evidence of significant modification
1.02		
1.03		
2.01	1. PERAL NAPPFAST Global Plant Hardiness ( <a href="http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20Ign d.tif">http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20Ign d.tif</a> ). 2. Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	1. Global plant hardiness zones 2-9. 2. China: Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [C Asia].
2.02		
2.03	1. Köppen-Geiger climate map ( <a href="http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf">http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf</a> ). 2. Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	1. Occurs in three climatic regions. 2. China: Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [C Asia].
2.04	1. Climate Source ( <a href="http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg">http://www.climatesource.com/cn/fact_sheets/chinapt_xl.jpg</a> ).	1. In the provinces listed for China, average annual precipitation ranges from <2 in/yr to >196.9 in/yr.
2.05	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"The shrubs are widely planted as ornamentals for their attractive fruits and flowers, and as borders, hedges, and ground cover." [genus description]
3.01		no evidence
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	1. Henderson, L (2001) Alien weeds and invasive plants: a complete guide to declared weeds and invaders in South Africa, including another 36 species invasive in that region. Plant Protection Research Institute, Pretoria. 2. Weber, E (2003) Invasive Plant Species of the World. CAB	1. Two congeners ( <i>C. franchetii</i> and <i>C. pannosus</i> ) are category 3 invaders in South Africa. 2. One congener is invasive in Australia. 3. One congener is present as a weed in Turkey [not enough evidence of

	International, Oxon, United Kingdom. 3. Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York.	invasiveness in reference #3].
4.01	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	no description of these traits
4.02		
4.03	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	no description of parasitism
4.04		
4.05	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	no evidence
4.06		
4.07	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	no evidence
4.08		
4.09		
4.1	USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources ( <a href="http://soils.usda.gov/use/worldsoils/mapindex/order.html">http://soils.usda.gov/use/worldsoils/mapindex/order.html</a> ).	The provinces of China and other country boundaries are not always well-defined on the soil orders map, but it is highly likely that the following soil order types occur in the regions of origin: alfisols, aridisols, entisols, gelisols, inceptisols, mollisols, ultisols (and the histisols and rocky land soil order types also occur in these areas).
4.11	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Shrubs deciduous, erect, 2-4 m tall".
4.12		
5.01		terrestrial

5.02	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	Rosaceae
5.03	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	Rosaceae
5.04	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Shrubs deciduous, erect, 2-4 m tall".
6.01		no evidence
6.02		
6.03	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Further studies are necessary to clarify a taxonomy complicated by hybridization and apomixis." [genus description]
6.04	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Further studies are necessary to clarify a taxonomy complicated by hybridization and apomixis." [genus description]
6.05		
6.06		
6.07		
7.01		
7.02	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"The shrubs are widely planted as ornamentals for their attractive fruits and flowers, and as borders, hedges, and ground cover." [genus description]
7.03		no evidence
7.04	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Fruit bright red, subglobose, 6-7 mm in diam." [no evidence of adaptations to wind dispersal]
7.05		
7.06	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Fruit bright red, subglobose, 6-7 mm in diam."

7.07	Lingdi, L and Brach, AR (1994) <i>Cotoneaster submultiflorus</i> . P. 94. In: Wu, Z and Raven, PH (editors). Flora of China. Vol. 9. Science Press (Beijing) and Missouri Botanical Garden (St. Louis).	"Fruit bright red, subglobose, 6-7 mm in diam." [no evidence of adaptations to external dispersal]
7.08		
8.01		
8.02		
8.03		
8.04		
8.05		