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

Muscari tenuiflorum			
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)	?	
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?	y	
3.01	Naturalized beyond native range	?	
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	n	-1
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	n	0
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	n	0
5.01	Aquatic	n	0
5.02	Grass	n	0
5.03	Nitrogen fixing woody plant	n	0
5.04	Geophyte	y	1
6.01	Evidence of substantial reproductive failure in native habitat	n	0
6.02	Produces viable seed	y	1
6.03	Hybridizes naturally	?	
6.04	Self-compatible or apomictic	y	1
6.05	Requires specialist pollinators	n	0
6.06	Reproduction by vegetative fragmentation	y	1
6.07	Minimum generative time (years)	8	-1
7.01	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
7.02	Propagules dispersed intentionally by people	y	1
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		
7.07	Propagules dispersed by other animals (externally)	y	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)	n	-1
8.03	Well controlled by herbicides		
8.04	Tolerates, or benefits from, mutilation or cultivation		
8.05	Effective natural enemies present in U.S.		
Total Score			5

Outcome	Accept*

*Used secondary screen from: Daehler, C. C., J.L. Denslow, S. Ansari, and H. Kuo. 2004. A risk assessment system for screening out harmful invasive pest plants from Hawaii's and other Pacific islands. Conserv. Biol. 18: 360-368.

section	# questions answered	satisfy minimum?
A	9	Yes
B	9	Yes
C	15	Yes
total	33	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 (http://www.nappfast.org/Plant_hardiness/NAPPFAST%20Global%20zones/10-year%20climate/PLANT_HARDINESS_10YR%20lgnd.tif). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?24767). 3. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 4. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 5. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 6. Ozhatay, N and Dalgic, G (1989) Muscari tenuiflorum in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21.	1. Global plant hardiness zones 4-8. 2. Western Asia: Iran [w.]; Iraq [n.]; Syria; Turkey; Caucasus: Armenia; Azerbaijan; Russian Federation - Ciscaucasia; Middle Europe: Austria; Czechoslovakia; Germany [s.]; Hungary; East Europe: Ukraine [incl. Krym]; Southeastern Europe: Albania; Bulgaria; Greece; Romania; Yugoslavia. 3. "The distribution of *M. tenuiflorum* ranges within the submeridional and south-temperate zone from south-eastern Europe to Anatolia, Transcaucasica and the Iranian Highland. There are occurrences isolated from the main range in Central Italy, north-east Italy and in Central Europe...The investigation of herbarium specimens revealed that there are still further occurrences in Saudi Arabia, i.e., Tabal Aja and Bir Iba."; "*M. tenuiflorum* reaches its north-western range edge in Germany" 4. "General distribution: Caucasus, Central Europe, Mediterranean, Asia Minor, Iran." 5. Eastern Europe

	7. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh. 8. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 314-315. Izdatel'stvo Akademii Nauk SSSR, Leningrad and Israel Program for Scientific Translations, Jerusalem (1968).	(Europaean part of former USSR), Caucasus. 6. "Although *M. tenuiflorum* is rather common in Anatolia, its actual distribution in European Turkey is not well known."; "General distribution: Central and South-east Europe, South Russia, Transcaucasia, Anatolia, West Syria, North Iraq, West Iran." 7. "C. & S.E. Europe, S. Russia, Transcaucasia, W. Syria, N. Iraq, W. Iran". 8. "Caucasus: Cisc., Dag., S. and E. Transc. Gen. distr.: E. Med., Bal. - As. Min. Described from Austria".
2.02		
2.03	1. Köppen-Geiger climate map (http://www.hydrol-earth-syst-sci.net/11/1633/2007/hess-11-1633-2007.pdf). 2. USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?24767). 3. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 4. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 5. Czerepanov, SK (1995) Vascular Plants of Russia and Adjacent States (the former USSR). Cambridge University Press, Cambridge and New York. 6. Ozhatay, N and Dalgic, G (1989) Muscari tenuiflorum in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21. 7. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh. 8. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 314-315. Izdatel'stvo Akademii Nauk SSSR, Leningrad and Israel Program for Scientific Translations, Jerusalem (1968).	1. Probably only two climatic regions, but there is a possibility of three (distribution range is not precise enough to determine if third climatic region applies for this species). 2. Western Asia: Iran [w.]; Iraq [n.]; Syria; Turkey; Caucasus: Armenia; Azerbaijan; Russian Federation - Ciscaucasia; Middle Europe: Austria; Czechoslovakia; Germany [s.]; Hungary; East Europe: Ukraine [incl. Krym]; Southeastern Europe: Albania; Bulgaria; Greece; Romania; Yugoslavia. 3. "The distribution of *M. tenuiflorum* ranges within the submeridional and south-temperate zone from south-eastern Europe to Anatolia, Transcaucasica and the Iranian Highland. There are occurrences isolated from the main range in Central Italy, north-east Italy and in Central Europe...The investigation of herbarium specimens revealed that there are still further occurrences in Saudi Arabia, i.e., Tabal Aja and Bir Iba."; "*M. tenuiflorum* reaches its north-western range edge in Germany" 4. "General distribution: Caucasus, Central Europe, Mediterranean, Asia Minor, Iran." 5. Eastern Europe (Europaean part of former USSR), Caucasus. 6. "Although *M. tenuiflorum* is rather common in Anatolia, its actual distribution in European Turkey is not well known."; "General distribution: Central and South-east Europe, South Russia,

		Transcaucasia, Anatolia, West Syria, North Iraq, West Iran." 7. "C. & S.E. Europe, S. Russia, Transcaucasia, W. Syria, N. Iraq, W. Iran". 8. "Caucasus: Cisc., Dag., S. and E. Transc. Gen. distr.: E. Med., Bal. - As. Min. Described from Austria".
2.04	1. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 2. Atlapedia Online (http://www.atlapedia.com/online/countries/iraq.htm). 3. Altapedia Online (http://www.atlapedia.com/online/countries/syria.htm). 4. Microsoft Encarta World Precipitation and Average Rainfall (http://uk.encarta.msn.com/encnet/RefPages/RefMedia.aspx?refid=461530746&artrefid=761554737&pn=3&sec=-1). 5. Atlapedia Online (http://www.atlapedia.com/online/countries/armenia.htm). 6. Atlapedia Online (http://www.atlapedia.com/online/countries/azerbaij.htm). 7. Atlapedia Online (http://www.atlapedia.com/online/countries/russia.htm). 8. Atlapedia Online (http://www.atlapedia.com/online/countries/czech.htm). 9. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 10. Atlapedia Online (http://www.atlapedia.com/online/countries/hungary.htm). 11. Atlapedia Online (http://www.atlapedia.com/online/countries/ukraine.htm). 12. Atlapedia Online (http://www.atlapedia.com/online/countries/albania.htm). 13. Atlapedia Online (http://www.atlapedia.com/online/countries/bulgaria.htm). 14. Atlapedia Online (http://www.atlapedia.com/online/countries/greece.htm). 15. Atlapedia Online (http://www.atlapedia.com/online/countries/romania.htm). 16. Atlapedia Online (http://www.atlapedia.com/online/countries/bosnia.htm). 17. United Nations Environment Programme, Country Environmental Profile Information System	1. For Iran, average annual precipitation ranges from less than 10 inches/year to 20 inches/year. 2. For Iraq: "in the northeast where it is highest, it varies from 400 to 600 mm (16 to 23 inches) annually." 3. For Syria: "The mountainous regions have moderate summers, although the interior plateaux have very hot summers and cold winters while the Hamad region has a true desert climate. The coolest month is January and the hottest are July and August. Average annual precipitation is 304 mm (12 inches) but varies from region to region." 4. For Turkey, average annual precipitation ranges from less than 10 inches/year to 40 inches/year. 5. For Armenia: average annual precipitation varies from 300 to 635 mm (12 to 25 inches). 6. For Azerbaijan: average annual precipitation is between 200 to 300 mm (8 to 12 inches) in the lowlands and 300 to 900 mm (12 to 35.5 inches) in the highlands, although precipitation is distributed unevenly throughout the year. 7. For the Russian Federation: rainfall is highest in the westerly mountain regions which has an average annual precipitation of up to 2,000 mm (79 inches) while on the East European Plain it averages between 600 and 700 mm (24 to 27.5 inches) and up to 1,000 (39 inches) in the southern areas of the Far East. 8. For the Czech Republic: "Average annual precipitation in Prague is about 510 mm (20 inches)." 9. "Most occurrences of *M. tenuiflorum* in Germany are found within the Central German dry region, situated in the rain shadow of the Harz mountains. In that area, long-term annual rainfall does not exceed 500 mm year^{-1}." 10. For

	(http://countryprofiles.unep.org/profiles/AT).	Hungary: "Average annual precipitation is 640 mm (25 inches)." 11. For the Ukraine: "Average annual precipitation varies from 300 mm (12 inches) in the south to 600 mm (24 inches) in the northwest and increases to more than 750 mm (30 inches) in the mountains." 12. For Albania: "Average annual precipitation in the mountain areas can exceed 1,000 mm (39 inches)." 13. For Bulgaria: "Average annual precipitation is 630 mm (25 inches)." 14. For Greece: "Average annual precipitation in Athens is 414 mm (16 inches)." 15. For Romania: "Average annual precipitation is 637 mm (25 inches)." 16. For Bosnia-Herzegovina [Yugoslavia]: "Herzegovina and the southern area has a modified Mediterranean climate with an average annual precipitation of 600 to 800 mm (24 to 31.5 inches) while (2.) the central and northern area of Bosnia has a modified Pannoian or Alpine climate with an average annual precipitation of 1,500 to 2,500 mm (59 to 98 inches)." 17. For Austria: "Average annual rainfall is about 660 mm (~26 in) in Vienna and 870 mm (~34.3 in) in Innsbruck, while some interior valleys average between about 1 500 (~59.1 in) and 2 000 mm (~78.7 in)."
2.05	1. RHS (http://www.rhs.org.uk/databases/Trials2.asp?Trialnum=4). 2. Cotswold Garden Flowers (http://www.cgf.net/plants.php?genus=MUSCARI). 3. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	1. *M. tenuiflorum* listed as a trial plant by the RHS (United Kingdom). 2. Cultivated in the U.K. 3. "*M. tenuiflorum* has no importance as [an] ornamental plant."
3.01	1. Hear.org, Global Compendium of Weeds (http://www.hear.org/gcw/species/muscari_tenuiflorum/). 2. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	1. Species is referenced as a weed in Williams, G and Hunyadi, K (1987) Dictionary of Weeds of Eastern Europe: their common names and importance in Latin, Albanian, Bulgarian, Czech, German, English, Greek, Hungarian, Polish, Romanian, Russian, Serbo-Croat and Slovak. Elsevier, Amsterdam. 2. "Today, *M. tenuiflorum* is extinct in Bavaria, and the historical occurrences

		are believed to have been introduced."
3.02		no evidence
3.03		no evidence
3.04		no evidence
3.05	Holm, L, JV Pancho, JP Herberger, and DL Plucknett (1979) A Geographical Atlas of World Weeds. John Wiley and Sons, New York.	One congener is present as a weed in the USA; two congeners are principal weeds in 2 countries.
4.01	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	no description of these traits
4.02		
4.03	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	no description of parasitism
4.04	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Most populations of *M. tenuiflorum* in Germany are in dry grasslands that traditionally have been used for sheep grazing for centuries. Thus, *M. tenuiflorum* is tolerant to grazing"
4.05	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Although there are no direct observations, occasionally mammalian herbivores seem to feed on *M. tenuiflorum*. In spring overwintering leaves were found to be bitten off probably by rabbits. During the flowering period inflorescences were found to be bitten off probably by roe deer." [no evidence of toxicity]
4.06	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"*M. tenuiflorum* is attacked by several pathogenic parasitic fungi. The smut fungus *Ustilago vaillantii* Tul & C. Tul….has been found on *M. tenuiflorum* in many parts of its range including Germany, Poland, Austria, Romania, and the "Carpathian region"…The rust fungus *Uromyces muscari* (Duby) L. Graves is a common parasite on *Muscari* species forming oval rust spots on the leaves and also has been found on *M. tenuiflorum* in Germany, Bohemia, Austria, and Poland. From South Russia the rust fungus

		Puccinia festucina Syd & P. Syd has been described [this species] obligately uses *M. tenuiflorum*"
4.07	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	no evidence
4.08	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"As reported by Klika (1929) continental grasslands in Bohemia were managed by annual burning, obviously without negative effects on *M. tenuiflorum*."
4.09	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Ozhatay, N and Dalgic, G (1989) Muscari tenuiflorum in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21.	1. "*M. tenuiflorum* typically occurs in open grassland habitats…although the species is also found under more or less shaded conditions at the edge of shrubs and within forests." 2. "Habitat: Open *Quercus* forest, hillsides."
4.1	1. USDA, National Resources Conservation Services (NRCS), Soil Survey Division, World Soil Resources (http://soils.usda.gov/use/worldsoils/mapindex/order.html). 2. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 3. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh.	1. Entisols occur throughout almost all of Iran and northwest Iran and northern Iraq. Mollisols occur in much of northeastern Turkey. Alfisols, entisols, and mollisols occur in Azerbaijan and entisols and mollisols occur in Armenia. Much of Europe (especially Eastern Europe) has alfisols and mollisols. Greece has only alfisols and entisols. 2. "The soils are mostly fine earth rich in nutrients and bases and belong to the type pararendzina and chernozem. In Central Germany M. tenuiflorum occurs over different parent rocks: Muschelkalk, porphyry, Schieferletten of the Buntsandstein, limestone from the Zechstein, sandstone from the Carboniferous and gypsum from the Keuper." 3. "On limestone, serpentine, gypsum and volcanic soils".
4.11	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 3. Walters, SM et al (1984) The	1. "Total height of the stem including inflorescence is 25-55 (-75) cm. The stem system of a mature plant is a sympodium. A stem generation of an adult plant consists usually of 1 cataphyll, followed by 3-6 assimilating leave, another single cataphyll which bears the renewal bud in

	European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh.	its axle and the single inflorescence (raceme) in terminal position." 2. "scapes erect; leaves in basal rosette" [genus description]. 3. "Herbaceous perennials...scape present" [genus description]. 4. "Scape (10-)20-60 cm, longer than leaves".
4.12	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 3. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh.	1. "Total height of the stem including inflorescence is 25-55 (-75) cm. The stem system of a mature plant is a sympodium. A stem generation of an adult plant consists usually of 1 cataphyll, followed by 3-6 assimilating leave, another single cataphyll which bears the renewal bud in its axle and the single inflorescence (raceme) in terminal position." 2. "scapes erect; leaves in basal rosette" [genus description]. 3. "Herbaceous perennials...scape present" [genus description]. 4. "Scape (10-)20-60 cm, longer than leaves".
5.01		terrestrial
5.02	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?24767).	Hyacinthaceae
5.03	USDA, ARS, National Genetic Resources Program. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland (http://www.ars-grin.gov/cgi-bin/npgs/html/taxon.pl?24767).	Hyacinthaceae
5.04	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 3. Ozhatay, N and Dalgic, G (1989) *Muscari tenuiflorum* in European Turkey:	1. "A bulbous, perennial, facultative wintergreen geophyte native to Central Europe"; "a bulbous perennial with a short, flattened underground stem covered by enlarged and fleshy cataphylls and leaf bases (=bulb scales) functioning as storage organs." 2. "Bulb conical or ovoid, of 15-30(60) semitunicate scales of

	Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21. 4. Walters, SM *et al* (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 5. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh. 6. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 314-315. Izdatel'stvo Akademii Nauk SSSR, Leningrad and Israel Program for Scientific Translations, Jerusalem (1968).	two or three annual cycles and regeneration buds" [genus description]. 3. "Bulb ovoid, 2-2.4 cm diam." 4. "Herbaceous perennials with bulbs, with or without offsets" [genus description]. 5. "Bulb ovoid, 2-3(-4) cm diam". 6. "Bulb 2.5 cm in diameter, obovoid".
6.01		no evidence
6.02	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Germination is epigeal as is typical for all species of the genus *Muscari*."; "Germination commences in the second half of March."
6.03	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"In the literature no hybrids with *M. tenuiflorum* are mentioned."
6.04	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"In early flowering stage, nearly a day after the circular mouth of the flower has opened by back-rolling of its perianth lobes, the receptive stigma is positioned behind the closed anthers. Then the style elongates to a length of 4 mm, placing the stigma between the anthers. This process coincides with the introrse dehiscence of the anthers, which occurs at first in the outer whorl of stamens, then in the inner one. Thus self-pollination becomes possible."; "Seed set in caged flowers or with additional hand self pollination showed only minor reductions in seed set. This indicates that *M. tenuiflorum* is fully self-compatible."
6.05	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Insects in most cases fly straight towards the fertile flowers"; "*M. tenuiflorum* is visited mainly by bumble bees of varying tongue length that gather nectar and

		pollen."; "Pollinating bumble bees showed flower constancy visiting exclusively *M. tenuiflorum* in up to 48 consecutive visits."
6.06	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Fedorov, AA (1999) Flora of Russia: The European Part and Bordering Regions. Volume IV. A.A. Balkema, Rotterdam and Brookfield, Vermont. 3. Ozhatay, N and Dalgic, G (1989) *Muscari tenuiflorum* in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21. 4. Walters, SM *et al* (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 5. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh. 6. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 314-315. Izdatel'stvo Akademii Nauk SSSR, Leningrad and Israel Program for Scientific Translations, Jerusalem (1968).	1. "A bulbous, perennial, facultative wintergreen geophyte native to Central Europe"; "a bulbous perennial with a short, flattened underground stem covered by enlarged and fleshy cataphylls and leaf bases (=bulb scales) functioning as storage organs." 2. "Bulb conical or ovoid, of 15-30(60) semitunicate scales of two or three annual cycles and regeneration buds" [genus description]. 3. "Bulb ovoid, 2-2.4 cm diam." 4. "Herbaceous perennials with bulbs, with or without offsets" [genus description]. 5. "Bulb ovoid, 2-3(-4) cm diam". 6. "Bulb 2.5 cm in diameter, obovoid".
6.07	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"The age at first flowering is not exactly known…After thorough morphological investigations we estimate the minimum age from seed to maturity as 8-10 years at least."
7.01		
7.02	1. RHS (http://www.rhs.org.uk/databases/Trials2.asp?Trialnum=4). 2. Cotswold Garden Flowers (http://www.cgf.net/plants.php?genus=MUSCARI). 3. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	1. *M. tenuiflorum* listed as a trial plant by the RHS (United Kingdom). 2. Cultivated in the U.K. 3. "*M. tenuiflorum* has no importance as [an] ornamental plant."
7.03		no evidence
7.04	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2.	1. "Seeds are black, ovate to globose, 2(-2.5) mm in diameter."; "The terminal velocity of falling seeds is very high

	Ozhatay, N and Dalgic, G (1989) Muscari tenuiflorum in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21. 3. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh. 5. Komarov, VL (1935) Flora of the U.S.S.R. Volume IV. Liliiflorae and Microspermae. Pp. 314-315. Izdatel'stvo Akademii Nauk SSSR, Leningrad and Israel Program for Scientific Translations, Jerusalem (1968).	preventing any dispersal by wind. The diaspores are dispersed by swaying movements of the infructescence (semachory) or by rain drops hitting the capsules (ombrochory)". 2. "seed 2-4 mm diam., ovoid, blackish, rugose-foveolate." 3. "Capsule strongly angled"; "seeds black, often shiny, often minutely wrinkled" [genus description]. 4. "Capsule broadly ovate to orbicular, obtuse or emarginate, 12-16 mm"; "seeds 2-3 mm diam". 5. "Capsule globose, 8-9 mm in diameter". [no evidence of adaptations to wind dispersal].
7.05		
7.06		
7.07	1. Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101. 2. Ozhatay, N and Dalgic, G (1989) Muscari tenuiflorum in European Turkey: Description, Distribution, Karyotype. J. Fac. Pharm. Istanbul 25: 17-21. 3. Walters, SM et al (1984) The European Garden Flora. Volume I. Pteridophyta, Gymnospermae, Angiospermae-Monocotyledons (Part I). Pp. 224-225. Cambridge University Press, Cambridge (Cambridgeshire) and New York. 4. Davis, PH (Editor) (1984) Flora of Turkey and the East Aegean Islands. Volume 8. Pp. 252-253. Edinburgh University Press, Edinburgh.	1. "Seeds are black, ovate to globose, 2(-2.5) mm in diameter."; "The terminal velocity of falling seeds is very high preventing any dispersal by wind. The diaspores are dispersed by swaying movements of the infructescence (semachory) or by rain drops hitting the capsules (ombrochory)". 2. "seed 2-4 mm diam., ovoid, blackish, rugose-foveolate." 3. "Capsule strongly angled"; "seeds black, often shiny, often minutely wrinkled" [genus description]. 4. "Capsule broadly ovate to orbicular, obtuse or emarginate, 12-16 mm"; "seeds 2-3 mm diam". 5. "Capsule globose, 8-9 mm in diameter". [no evidence of adaptations to external dispersal].
7.08		
8.01	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Individual plants can produce up to 430 seeds. The mean number of seeds per plant ranged from 55 to 106 among populations."
8.02	Herrman, N, Weiss, G, and Durka, W (2006) Biological flora of Central Europe: *Muscari tenuiflorum* Tausch. Flora 201: 81-101.	"Dormancy must be broken by prolonged cold stratification under moist conditions…However, *M. tenuiflorum* does not form a persistent seed bank."
8.03		

8.04		
8.05		