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|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Taxon: Dactylis glomerata | Family: Poaceae |
| Common Name(s): barnyard grass cocksfoot cockspur orchard grass | Synonym(s): Dactylis aschersoniana Graebn. Dactylis hispanica Roth Dactylis polygama Horv. Dactylis woronowii Ovcz. |

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| Assessor: Chuck Chimera | Status: Assessor Approved | End Date: 3 Aug 2015 |
| WRA Score: 18.0 | Designation: H(Hawai'i) | Rating: High Risk |

Keywords: Invasive Grass, Environmental Weed, Fodder, Shade-Tolerant, Self-Compatible

| Qsn # | Question | Answer Option | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------|
| 101 | Is the species highly domesticated? | y=-3, n=0 | n |
| 102 | Has the species become naturalized where grown? | | |
| 103 | Does the species have weedy races? | | |
| 201 | Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical" | (0-low; 1-intermediate; 2-high) (See Appendix 2) | High |
| 202 | Quality of climate match data | (0-low; 1-intermediate; 2-high) (See Appendix 2) | High |
| 203 | Broad climate suitability (environmental versatility) | y=1, n=0 | y |
| 204 | Native or naturalized in regions with tropical or subtropical climates | y=1, n=0 | y |
| 205 | Does the species have a history of repeated introductions outside its natural range? | y=-2, ?=-1, n=0 | y |
| 301 | Naturalized beyond native range | y = 1*multiplier (see Appendix 2), n= question 205 | y |
| 302 | Garden/amenity/disturbance weed | | |
| 303 | Agricultural/forestry/horticultural weed | n=0, y = 2*multiplier (see Appendix 2) | n |
| 304 | Environmental weed | n=0, y = 2*multiplier (see Appendix 2) | y |
| 305 | Congeneric weed | n=0, y = 1*multiplier (see Appendix 2) | n |
| 401 | Produces spines, thorns or burrs | y=1, n=0 | n |
| 402 | Allelopathic | | |
| 403 | Parasitic | y=1, n=0 | n |
| 404 | Unpalatable to grazing animals | y=1, n=-1 | n |
| 405 | Toxic to animals | y=1, n=0 | n |
| 406 | Host for recognized pests and pathogens | | |
| 407 | Causes allergies or is otherwise toxic to humans | y=1, n=0 | y |
| 408 | Creates a fire hazard in natural ecosystems | | |

| Qsn # | Question | Answer Option | Answer |
|-------|------------------------------------------------------------------------------------------------|---------------------------------------------|--------|
| 409 | Is a shade tolerant plant at some stage of its life cycle | y=1, n=0 | y |
| 410 | Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island) | y=1, n=0 | y |
| 411 | Climbing or smothering growth habit | y=1, n=0 | n |
| 412 | Forms dense thickets | y=1, n=0 | y |
| 501 | Aquatic | y=5, n=0 | n |
| 502 | Grass | y=1, n=0 | y |
| 503 | Nitrogen fixing woody plant | y=1, n=0 | n |
| 504 | Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers) | y=1, n=0 | n |
| 601 | Evidence of substantial reproductive failure in native habitat | y=1, n=0 | n |
| 602 | Produces viable seed | y=1, n=-1 | y |
| 603 | Hybridizes naturally | | |
| 604 | Self-compatible or apomictic | y=1, n=-1 | y |
| 605 | Requires specialist pollinators | y=-1, n=0 | n |
| 606 | Reproduction by vegetative fragmentation | y=1, n=-1 | n |
| 607 | Minimum generative time (years) | 1 year = 1, 2 or 3 years = 0, 4+ years = -1 | 1 |
| 701 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | | |
| 702 | Propagules dispersed intentionally by people | y=1, n=-1 | y |
| 703 | Propagules likely to disperse as a produce contaminant | y=1, n=-1 | y |
| 704 | Propagules adapted to wind dispersal | y=1, n=-1 | y |
| 705 | Propagules water dispersed | y=1, n=-1 | n |
| 706 | Propagules bird dispersed | | |
| 707 | Propagules dispersed by other animals (externally) | y=1, n=-1 | y |
| 708 | Propagules survive passage through the gut | y=1, n=-1 | y |
| 801 | Prolific seed production (>1000/m ²) | | |
| 802 | Evidence that a persistent propagule bank is formed (>1 yr) | y=1, n=-1 | n |
| 803 | Well controlled by herbicides | y=-1, n=1 | y |
| 804 | Tolerates, or benefits from, mutilation, cultivation, or fire | y=1, n=-1 | y |
| 805 | Effective natural enemies present locally (e.g. introduced biocontrol agents) | y=-1, n=1 | n |

Supporting Data:

| Qsn # | Question | Answer |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 101 | Is the species highly domesticated? | n |
| | Source(s) | Notes |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | [Assessment of type naturalized in the Hawaiian Islands] "It is a highly variable species with several varieties in Europe, and several cultivars have been developed differing in phenology." |
| | Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | [Multiple uses. No evidence of domestication] "noxious weed species, can withstand heavy grazing, moderately nutritious and highly palatable, cultivated fodder, meadow and pasture grass, forage, cause of hay fever, ornamental honey plant," |

| | | |
|-----|-------------------------------------------------|-------|
| 102 | Has the species become naturalized where grown? | |
| | Source(s) | Notes |
| | WRA Specialist. 2015. Personal Communication | NA |

| | | |
|-----|----------------------------------------------|-------|
| 103 | Does the species have weedy races? | |
| | Source(s) | Notes |
| | WRA Specialist. 2015. Personal Communication | NA |

| | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 201 | Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical" | High |
| | Source(s) | Notes |

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 31 Jul 2015]</p> | <p>"Native: AFRICA Macaronesia: Portugal - Madeira Islands Northern Africa: Algeria; Egypt; Libya; Morocco; Tunisia ASIA-TEMPERATE Western Asia: Afghanistan; Cyprus; Iran; Iraq; Israel; Jordan; Lebanon; Syria; Turkey Caucasus: Armenia; Azerbaijan; Georgia; Russian Federation - Ciscaucasia, Dagestan Siberia: Russian Federation - Eastern Siberia, Western Siberia Middle Asia: Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan Mongolia: Mongolia ASIA-TROPICAL Indian Subcontinent: India [n.]; Pakistan EUROPE Northern Europe: Denmark; Finland; Ireland; Norway; Sweden; United Kingdom Middle Europe: Austria; Belgium; Czech Republic; Germany; Hungary; Netherlands; Poland; Slovakia; Switzerland East Europe: Belarus; Estonia; Latvia; Lithuania; Moldova; Russian Federation - European part; Ukraine [incl. Krym] Southeastern Europe: Bulgaria; Croatia; Greece; Italy [incl. Sardinia, Sicily]; Romania; Serbia; Slovenia Southwestern Europe: France [incl. Corsica]; Portugal; Spain [incl. Balears]"</p> |
| | <p>Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL</p> | <p>"North Africa, Mediterranean. Europe."</p> |

| 202 | Quality of climate match data | High |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| | Source(s) | Notes |
| | <p>USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/. [Accessed 31 Jul 2015]</p> | |

| 203 | Broad climate suitability (environmental versatility) | y |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | <p>Duke, J.A. 1983. Handbook of Energy Crops - <i>Dactylis glomerata</i>. https://www.hort.purdue.edu/newcrop/duke_energy/Dactylis_glomerata.html. [Accessed 31 Jul 2015]</p> | <p>"Ranging from Boreal Moist to Rain through Subtropical Thorn to Moist Forest Life Zones, orchardgrass is reported to tolerate annual precipitation of 3.1 to 17.6 dm (mean of 83 cases = 8.2) annual temperature of 4.3 to 23.8°C (mean of 83 cases = 10.7) and pH of 4.5 to 8.2 (mean of 83 cases = 6.3) (Duke, 1978, 1979). Adapted to humid temperate climates, naturalized in field and waste places. "</p> |
| | <p>Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI.</p> | <p>[Elevation range exceeds 2000 m in the Hawaiian Islands, demonstrating environmental versatility] "in Hawai'i naturalized and abundant in pastures and along trails and roadsides, 100- 2,290 m"</p> |

| Qsn # | Question | Answer |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 204 | Native or naturalized in regions with tropical or subtropical climates | y |
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "in Hawai'i naturalized and abundant in pastures and along trails and roadsides, 100- 2,290 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i." |

| | | |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 205 | Does the species have a history of repeated introductions outside its natural range? | y |
| | Source(s) | Notes |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass was introduced to the eastern United States from Europe in 1760. It is widely planted in the United States and Canada, and is found from Nova Scotia south to the Carolinas, west to central California, and north to coastal British Columbia" |

| | | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 301 | Naturalized beyond native range | y |
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Native to Europe, now widely cultivated and naturalized; in Hawai'i naturalized and abundant in pastures and along trails and roadsides, 100- 2,290 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i. First collected on Hawai'i in 1909 (Rock 3212, BISH)." |
| | USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 31 Jul 2015] | "Naturalized: AFRICA East Tropical Africa: Tanzania Southern Africa: Lesotho; South Africa AUSTRALASIA Australia: Australia New Zealand: New Zealand NORTHERN AMERICA Northeastern U.S.A.: United States - West Virginia Southeastern U.S.A.: United States - Alabama, Georgia, Kentucky, Mississippi, South Carolina, Virginia PACIFIC North-Central Pacific: United States - Hawaii SOUTHERN AMERICA Mesoamerica: Costa Rica Southern South America: Argentina; Uruguay" |
| | Starr, F. & Starr, K. 2011. New plant records from midway Atoll, Maui and Kaho'olawe. Bishop Museum Occasional Papers. 110: 23-35 | "The following specimens were collected at an elevation of 10,000 ft [3050 m] at the Haleakalā observatories facility on Pu'u kolekole, on the summit of east Maui. these new high elevation records extend the known altitudinal range of these species in Hawai'i. Previous high elevations are from Wagner et al., 1999." [Includes <i>Dactylis glomerata</i>] |

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| 302 | Garden/amenity/disturbance weed | |
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| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | [Invades disturbed sites, with negative environmental impacts] "It has been grown as a pasture grass but has also spread into disturbed sites and natural plant communities." |

| 303 | Agricultural/forestry/horticultural weed | n |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | "D. glomerata has been widely adopted as a very valuable pasture grass in many temperate countries. Its negative impacts seem to be relatively small (CAL-IPC, 2015)." |

| 304 | Environmental weed | y |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Queensland Government. 2011. Weeds of Australia - Cocksfoot <i>Dactylis glomerata</i> . http://keyserver.lucidcentral.org/weeds/data/03030800-0b07-490a-8d04-0605030c0f01/media/Html/Dactylis_glomerata.htm . [Accessed 31 Jul 2015] | "Cocksfoot (<i>Dactylis glomerata</i>) is regarded as an environmental weed in Victoria, Tasmania, ACT and New South Wales. It has been grown as a pasture grass, but has also spread into disturbed sites and natural plant communities. It is invasive in heathlands, open woodlands, forests, riparian habitats, freshwater wetlands and coastal environs, where it forms dense swards that suppress native grasses and forbs. For example, it has invaded some low-lying parts of the open woodlands that form the Queanbeyan Nature Reserve in the ACT. This reserve is the only protected habitat of the endangered button wrinklewort (<i>Rutidosia leptorrhynchoides</i>), and cocksfoot (<i>Dactylis glomerata</i>) directly competes with it for space, nutrients, light and moisture." |
| | US Fish and Wildlife Service. 2012. 50 CFR Part 17. Endangered and Threatened Wildlife and Plants; Listing 38 Species on Molokai, Lanai, and Maui as Endangered and Designating Critical Habitat on Molokai, Lanai, Maui, and Kahoolawe for 135 Species; Proposed Rule. Federal Register Vol. 77, No. 112 | "Nonnative Plants in the Subalpine Ecosystem ... Nonnative grasses that are a threat to this ecosystem include <i>Anthoxanthum odoratum</i> (sweet vernalgrass) and <i>Dactylis glomerata</i> (cocksfoot) (HBMP 2008)." ... "Nonnative Plants in the Dry Cliff Ecosystem ... Nonnative grasses that threaten this ecosystem include <i>Andropogon virginicus</i> , <i>Anthoxanthum odoratum</i> , <i>Dactylis glomerata</i> , and <i>Holcus lanatus</i> (HBMP 2008). These nonnative plant species pose serious and ongoing threats to all three of the species proposed for listing that depend on this ecosystem ..." |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | "The grass establishes in disturbed sites and forms dense swards that suppress native grasses and forbs." |
| | Loope, L.L., Nagata, R.J. & Medeiros, A.C. 1992, Alien plants in Haleakala National Park Pp. 551-576 in Stone et al (eds) Alien plant invasions in native ecosystems of Hawaii. Coop. Nat. Park Resources Studies Unit, University of Hawaii, Honolulu, HI | "The subalpine shrubland has been modified by years of impact of goats, cattle, and pigs. The often dense mat of alien grasses such as velvet grass (<i>Holcus lanatus</i>), sweet vernalgrass (<i>Anthoxanthum odoratum</i>), and orchard grass (<i>Dactylis glomerata</i>) inhibits reproduction by seed of native shrubs." |

| Qsn # | Question | Answer |
|-------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| 305 | Congeneric weed | n |
| | Source(s) | Notes |
| | Randall, R.P. 2012. A Global Compendium of Weeds. 2nd Edition. Department of Agriculture and Food, Western Australia | Dactylis marina listed as a quarantine weed for Western Australia, but no impacts have been documented to date |

| 401 | Produces spines, thorns or burrs | n |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Tufted perennials; culms 15-140 cm tall, erect or spreading, slender to stout, the vegetative shoots strongly compressed. Sheaths strongly compressed and keeled; ligule oblong-ovate, 4-8 mm long, fimbriate-lacerate; blades 10-45 cm long, 2-14 mm wide, folded, glabrous." |

| 402 | Allelopathic | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Scognamiglio, M., Fiumano, V., D'Abrosca, B., Pacifico, S., Messere, A., Esposito, A., & Fiorentino, A. (2012). Allelopathic potential of alkylphenols from <i>Dactylis glomerata</i> subsp. <i>hispanica</i> (Roth) Nyman. <i>Phytochemistry Letters</i> , 5(1): 206-210 | [Possible stimulatory effects] "Eleven alkylphenols were isolated from the aerial parts of <i>Dactylis glomerata</i> subsp. <i>hispanica</i> , six of them described for the first time. The structural characterization of these compounds has been elucidated by 1D and 2D NMR techniques. The fragmentation patterns of the metabolites obtained by G-MS analysis allowed the side chain to be elucidated. The allelopathic potential of three alkylphenols, representative of each homologous series of alkylphenols from <i>D. glomerata</i> subsp. <i>hispanica</i> , has been assayed on <i>D. glomerata</i> subsp. <i>hispanica</i> and an herbaceous coexisting species, <i>Phleum subulatum</i> . The bioassay results showed a high auto-stimulation values of germination and root and shoot elongation for <i>D. glomerata</i> subsp. <i>hispanica</i> at high concentrations." |

| 403 | Parasitic | n |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Tufted perennials" [Poaceae. No evidence] |

| 404 | Unpalatable to grazing animals | n |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | "nutritious and highly palatable, cultivated fodder, meadow and pasture grass, forage," |

| Qsn # | Question | Answer |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass is moderately nutritious and highly palatable to deer, elk, bighorn sheep, cattle, and domestic sheep and goats. The persistent, green, basal rosette provides good winter forage for deer and elk [14,50]. Early spring growth provides green forage for all species [60]. Cattle will eat orchardgrass preferentially in early spring and summer, up to 50 percent of total diet [59,65]. Elk and mule deer also prefer orchardgrass over a number of other species [42]." |

| 405 | Toxic to animals | n |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Feedipedia. 2015. Cocksfoot (<i>Dactylis glomerata</i>). http://www.feedipedia.org/node/466 . [Accessed 3 Aug 2015] | "Cocksfoot is free of alkaloids and mycotoxins (Barnes et al., 2007)." |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | [No evidence] "Palatability is rated high for cattle, elk, mule deer, and white-tailed deer" |

| 406 | Host for recognized pests and pathogens | |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Pfender, W. F. (2001). Host range differences between populations of <i>Puccinia graminis</i> subsp. <i>graminicola</i> obtained from perennial ryegrass and tall fescue. <i>Plant Disease</i> , 85(9): 993-998 | "In the Pacific Northwest region of the United States, cool-season grasses grown for seed can be severely damaged by <i>Puccinia graminis</i> subsp. <i>graminicola</i> , causal agent of stem rust." ... "Cool-season grasses are intensively cultivated for seed production in western Oregon, where stem rust is the most damaging disease on several species, including perennial ryegrass (<i>Lolium perenne</i>), annual ryegrass (<i>L. multiflorum</i>), and tall fescue (<i>Festuca arundinacea</i>). Stem rust also occurs on seed crops of orchard grass (<i>Dactylis glomerata</i>) and red fescue (<i>F. rubra</i>) in the region." |
| | Capinera, J.L. 2001. <i>Handbook of Vegetable Pests</i> . Academic Press, London, UK | "Potato stem borer is polyphagous, but it is known principally as a pest of potato, com, and rhubarb." ... "Several grasses can serve as hosts, including ... orchardgrass, <i>Dactylis glomerata</i> ..." [One of several hosts listed for this pest] |

| Qsn # | Question | Answer |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Sánchez Márquez, S., Bills, G. F., & Zabalgogeoazcoa, I. (2007). The endophytic mycobiota of the grass <i>Dactylis glomerata</i> . <i>Fungal Diversity</i> 27: 171-195 | [Possible host of grass pathogens] "Fungal endophytes were isolated from asymptomatic and symptomatic plants of <i>Dactylis glomerata</i> sampled in different ecosystems in Spain. Fungi were identified using morphological, as well as molecular methods based on internal transcribed spacer (ITS) and ribosomal DNA sequencing. Molecular data provided a framework for identification and assessing the phylogenetic position of isolates. One hundred and nine different fungal species were identified. Eighteen of these species were potentially unknown. The endophytic assemblage consists of grass-specific, as well as generalist species, and is quite different from those described for perennial woody species. Species richness curves showed that the survey discovered most species commonly infecting this grass, but the number of sporadic infections of singleton species continued to increase with more sampling effort. A large endophytic assemblage consisting of fungi with diverse ecological roles, and potentially unknown species, was found in a small herbaceous plant." ... "Most of the species isolated from diseased tissues (Table 5) are pathogens of grasses (Mathre, 1982; Wiese, 1987, Farr et al., 1989). However, most of these species were also isolated from healthy plants (Table 3). Therefore, those fungi isolated from diseased and healthy plants may represent a group of latent pathogens." |

| 407 | Causes allergies or is otherwise toxic to humans | y |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Pollen Library. 2015. Orchard Grass (<i>Dactylis glomerata</i>). http://www.pollenlibrary.com/Specie/Dactylis+glomerata/ . [Accessed 3 Aug 2015] | "Allergenicity: Orchard Grass (<i>Dactylis glomerata</i>) is a severe allergen." |
| | Quattrocchi, U. 2006. <i>CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL | "cause of hay fever" |
| | Lockey, R.F. 2004. <i>Allergens and Allergen Immunotherapy</i> , Third Edition. Marcel Dekker, Inc., New York, NY | "The cool-season turfgrasses representing this subfamily include the genera <i>Poa</i> (bluegrasses), <i>Agrostis</i> (bent grasses) <i>Festuca</i> (fescues), and <i>Lolium</i> (ryegrasses). These represent the major allergenic grass genera along with <i>Dactylis glomerata</i> orchard grass), <i>Phleum pratense</i> (timothy grass), and <i>Anthoxanthum odoratum</i> (vernal grass), which are common in meadow , pastures, and waste place ." |

| 408 | Creates a fire hazard in natural ecosystems | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: <i>Fire Effects Information System</i> , [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | [Possibly increases fire risk] "Orchardgrass is frequently seeded onto areas disturbed by fire to control soil erosion. Concern has been raised that the increase of grass species in the area, especially summer-dormant grasses such as orchardgrass, could increase the risk of fast-spreading, low-intensity fires that could set back the rate of tree and shrub regeneration. The application of seed to reduce erosion is, therefore, not always beneficial [12,31]." |

| 409 | Is a shade tolerant plant at some stage of its life cycle | y |
|-----|-----------------------------------------------------------|---|
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| Qsn # | Question | Answer |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | "drought- and shade-tolerant" |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass is shade tolerant and does well at higher elevations in the western United States and Canada (4,900 to 6,200 feet [1,500-1,900,m]) [28]." |

| 410 | Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island) | y |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Duke, J.A. 1983. Handbook of Energy Crops - <i>Dactylis glomerata</i> . https://www.hort.purdue.edu/newcrop/duke_energy/Dactylis_glomerata.html . [Accessed 31 Jul 2015] | "Grows on almost any type of soil, but thrives best on heavier types, as clays and clay loams." |
| | Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | "sandy soil , clays and clay loams" |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. The Journal of Ecology, 47(1): 223-239 | "Substratum. <i>D. glomerata</i> grows best in soils with pH from 6.0 to 7.0, but it is found over a range of from 5.5 to 8.0 (Spurway 1941)." |

| 411 | Climbing or smothering growth habit | n |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Tufted perennials; culms 15-140 cm tall, erect or spreading, slender to stout, the vegetative shoots strongly compressed." |

| 412 | Forms dense thickets | y |
|-----|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | "The grass establishes in disturbed sites and forms dense swards that suppress native grasses and forbs." |

| 501 | Aquatic | n |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [Terrestrial grass] "Tufted perennials" ... "naturalized and abundant in pastures and along trails and roadsides" |

| 502 | Grass | y |
|-----|-------|---|
|-----|-------|---|

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | USDA, ARS, National Genetic Resources Program. 2015. Germplasm Resources Information Network - (GRIN) [Online Database]. National Germplasm Resources Laboratory, Beltsville, Maryland. URL: http://www.ars-grin.gov/ . [Accessed 31 Jul 2015] | "Family: Poaceae (alt. Gramineae) subfamily: Pooideae tribe: Poeae subtribe: Dactylidinae" |

| | | |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 503 | Nitrogen fixing woody plant | n |
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | Poaceae |

| | | |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 504 | Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers) | n |
| | Source(s) | Notes |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass is nonrhizomatous [21]. Most root development is in the upper 3 inches (8 cm) of soil but extends to at least 18 inches (46 cm) below the surface [23], producing a dense sod of medium-sized roots [26]." |

| | | |
|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 601 | Evidence of substantial reproductive failure in native habitat | n |
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [No evidence] "Native to Europe, now widely cultivated and naturalized" |

| | | |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 602 | Produces viable seed | y |
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R.& Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Caryopsis loosely enclosed by lemma and palea, ellipsoid to lanceoloid-ellipsoid, ca. 3 mm long." |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass reproduces largely by seed and by tiller formation. The relatively large seed does not have an innate dormancy [24]. Seed can germinate in either light or darkness; germination is largely controlled by moisture availability, and most seed germinates in the fall. Thus, orchardgrass does not tend to build up seedbanks in the soil [24]." |

| | | |
|------------|-----------------------------|--------------|
| 603 | Hybridizes naturally | |
| | Source(s) | Notes |

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Matzk, F. (1981). Successful crosses between <i>Festuca arundinacea</i> Schreb. and <i>Dactylis glomerata</i> L. <i>Theoretical and Applied Genetics</i> , 60(2): 119-122 | "Five F1 plants have been obtained after extensive crossing between different ecotypes or varieties of <i>Festuca arundinacea</i> Schreb. and <i>Dactylis glomerata</i> L. The success did not appear to depend on specific treatments (spraying with ε-aminocaproic acid or gibberellic acid or pre pollination with killed pollen from the seed parent), but the crossability is limited to exceptional plants. F1 hybrids showed characteristics of both the parents. In four hybrids various developmental disturbances were observed (low viability, aneusomaty, absence of development of inflorescences). Only one hybrid consistently showed 2n=35 chromosomes, good viability and growth, however, it was sterile. After clonal propagation, attempts for polyploidization were started." |
| | Hanson, A.A. & Carnahan, H.L. 1956. Breeding perennial forage grasses. Technical Bulletin No. 1145. USDA Agricultural Research Service, Washington, D.C. | [Artificial hybrids possible] "Several of the hybrids suggested by Ullmann (297) have been produced. <i>Dactylis glomerata</i> has been hybridized with <i>D. aschersoniana</i> Graebn. and with <i>D. voronowii</i> Oucz. Although some of the hybrid plants look rather interesting, they are less vigorous than <i>D. glomerata</i> ." |

| 604 | Self-compatible or apomictic | y |
|-----|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. <i>The Journal of Ecology</i> , 47(1): 223-239 | "Although cross-fertilization is usual, self-fertilization is possible in some plants." ... "Stapledon (1928) found only 14 plants out of 250 tested (5-6%) which failed to produce seed on selfing. In recent tests self-sterile plants made up 35 % of the total (240) and those giving from 1 to 5 seeds per unit, 28%. The remainder gave seeds in increasing amounts but the number of highly self fertile plants was few (Fig. 2), only 8 % gave 100 seeds or more per selfing-unit" |

| 605 | Requires specialist pollinators | n |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | "Inflorescences paniculate, oblong to ovate, 2-30 cm long, the branches closely spaced, usually the lower ones distant and without spikelets; spikelets oblong or cuneate, 5-9 mm long, aggregated in compact fascicles; glumes lanceolate to ovate, 3-6 mm long, 1-nerved, keel ciliate, first glume 2-6 mm long, second glume 3-7 mm long; lemmas lanceolate to oblong in side view, 4-7 mm long, keel ciliate or scabrous, apex with a rigid awn up to 1.5 mm long; palea lanceolate." |
| | Zomlefer, W.B. 1994. Guide to Flowering Plant Families. The University of North Carolina Press, Chapel Hill & London | Poaceae [anemophilous. Wind-pollinated] |

| 606 | Reproduction by vegetative fragmentation | n |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Quattrocchi, U. 2006. CRC World Dictionary of Grasses: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL | "reproduces sexually by seed production and asexually by tiller formation" |

| Qsn # | Question | Answer |
|-------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. The Journal of Ecology, 47(1): 223-239 | <i>D. glomerata</i> is caespitose and has neither rhizomes nor stolons so that vegetative propagation does not normally occur. If plantlets of proliferated inflorescences come into contact with the soil they will root; the aerially-produced tillers, the 'birds-nests' or 'mops' described by Arber (1934), could behave similarly." |

| 607 | Minimum generative time (years) | 1 |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | "Although individual tussocks of <i>D. glomerata</i> can become quite large, the main method of reproduction is by seed. Seed distribution relies mainly on stiff winds and its transport by birds, animals and man. Beddows (1959) suggests that water dispersal is unlikely. Before flower shoot initiation can take place, plants must be subjected to a period of cold and then receive a photoperiod of at least 12 hours (Beddows, 1959). In Britain, Beddows reported that flowering may begin towards the end of May, is more general in June and may continue into July. Sporadic flowering can continue through autumn and even into winter. Although cross fertilisation is usual, self fertilisation is possible in some plants: caryopses from outcrosses showed about 10% higher viability than those from inbreeding." |
| | GrowOrganic.com. 2015. Organic Orchardgrass. http://www.groworganic.com/organic-orchardgrass-lb.html . [Accessed 3 Aug 2015] | "Time to Maturity: 8 Weeks" |

| 701 | Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas) | |
|-----|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. The Journal of Ecology, 47(1): 223-239 | [Possibly. Hairs may aid in external attachment] "There is no special mechanism for seed dispersal, but the stiff cilia on the keels of the lemma may assist in this (C. E. Hubbard). In the main, therefore, it depends on casual agencies, such as strong winds, and, for greater distances, being carried by birds, animals and man" |

| 702 | Propagules dispersed intentionally by people | y |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass is a widely planted pasture grass [1,21,25,62] and is used to increase forage production on rangelands [48]. It is frequently part of mixtures that are seeded in mountain brush (especially Gambel oak (<i>Quercus gambelii</i>) types to improve rangeland. These mixtures are drilled or broadcast seeded after some type of surface preparation--usually removal of brush by burning or chaining, or by herbicide application [6,38]. Orchardgrass is used to stabilize ski slopes in Montana and to suppress annual weeds [5,39,40,41]." |

| 703 | Propagules likely to disperse as a produce contaminant | y |
|-----|--------------------------------------------------------|---|
| | | |

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Bush, T, Ogle, D., St. John. L., Stannard, M., Jensen, K. (eds.) (2012). Plant Guide for Orchardgrass (<i>Dactylis glomerata</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, ID | "Orchardgrass can be a problem weed in turf type tall fescue and bluegrass lawns. Infestations of lawns are common where the site was previously in pasture or hay production but most often results from contaminated seed used to establish the lawn. The first line of defense is to purchase turf seed that is not contaminated by orchardgrass." |

| 704 | Propagules adapted to wind dispersal | y |
|-----|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | "Seed production is usually high, and seeds are dispersed by wind, water and by adhering to animals" |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. The Journal of Ecology, 47(1): 223-239 | "There is no special mechanism for seed dispersal, but the stiff cilia on the keels of the lemma may assist in this (C. E. Hubbard). In the main, therefore, it depends on casual agencies, such as strong winds, and, for greater distances, being carried by birds, animals and man." |

| 705 | Propagules water dispersed | n |
|-----|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. The Journal of Ecology, 47(1): 223-239 | "Flowing water is unlikely to be a very effective dispersal agent, because <i>D. glomerata</i> caryopses, on the germinator at least, are sensitive to excess water and resent swamping (Mercer 1948)." |

| 706 | Propagules bird dispersed | |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | [Possibly] "Seed distribution relies mainly on stiff winds and its transport by birds, animals and man. Beddows (1959) suggests that water dispersal is unlikely." |

| 707 | Propagules dispersed by other animals (externally) | y |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | "Seed production is usually high, and seeds are dispersed by wind, water and by adhering to animals." |
| | Couvreur, M., Christiaen, B., Verheyen, K., & Hermy, M. (2004). Large herbivores as mobile links between isolated nature reserves through adhesive seed dispersal. Applied Vegetation Science, 7(2): 229-236 | "Table 1. Plant species identified in the fur of 201 large herbivores" [Dactylis glomerata seeds collected in the fur of Galloway cattle & donkeys] |

| 708 | Propagules survive passage through the gut | y |
|-----|--------------------------------------------|--------------|
| | Source(s) | Notes |

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Welch, D. (1985). Studies in the grazing of heather moorland in north-east Scotland. IV. Seed dispersal and plant establishment in dung. <i>Journal of Applied Ecology</i> , 22(2): 461-472 | "Species germinating in a glasshouse on dung samples of only one herbivore type" [Dactylis glomerata seeds germinate in cattle dung] |
| | Myers, J. A., Vellend, M., Gardescu, S., & Marks, P. L. (2004). Seed dispersal by white-tailed deer: implications for long-distance dispersal, invasion, and migration of plants in eastern North America. <i>Oecologia</i> , 139(1): 35-44 | "Table 2 Species germinating from white-tailed deer feces collected at two sites, showing totals, maximum germinations per pellet group, and frequency" [Includes Dactylis glomerata] |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. <i>The Journal of Ecology</i> , 47(1): 223-239 | "There is no evidence that <i>D. glomerata</i> seeds can survive passage through the digestive tract of grazing animals. No seedlings developed from the dung of steers fed throughout one winter with up to 2 lb per day of pure viable <i>D. glomerata</i> . Indeed, there is little chance of undamaged caryopses reappearing because of the thoroughness of maceration (Ll. Iorwerth Jones)." |

| 801 | Prolific seed production (>1000/m2) | |
|-----|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Weber, E. 2003. <i>Invasive Plant Species of the World. A Reference Guide to Environmental Weeds.</i> CABI Publishing, Wallingford, UK | [Densities unknown] "Seed production is usually high, and seeds are dispersed by wind, water and adhering to animals." |

| 802 | Evidence that a persistent propagule bank is formed (>1 yr) | n |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Beddows, A. R. (1959). <i>Dactylis glomerata</i> L. <i>The Journal of Ecology</i> , 47(1): 223-239 | " <i>D. glomerata</i> seeds are not well adapted to survival in the soil, and the experience of agronomists is that very few of those buried develop. This may also in part be because they are mainly to be found in the top 3 in. of soil so that ploughing tends to keep them buried" |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: <i>Invasive Species Compendium.</i> Wallingford, UK: CAB International. www.cabi.org/isc | "Optimum temperature for germination seems to require a night temperature of 22o for 18 hours and a day temperature of 30oC (Beddows, 1959). Very few seeds buried in the soil survive for any length of time." |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: <i>Fire Effects Information System</i> , [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "The relatively large seed does not have an innate dormancy [24]. Seed can germinate in either light or darkness; germination is largely controlled by moisture availability, and most seed germinates in the fall. Thus, orchardgrass does not tend to build up seedbanks in the soil [24]." ,,, "most seed will germinate in fall as there is no innate dormancy [24]." |

| 803 | Well controlled by herbicides | y |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: <i>Invasive Species Compendium.</i> Wallingford, UK: CAB International. www.cabi.org/isc | "Chemical Control: Muyt (2001) says that plants can be treated with non-selective herbicides like glyphosate or grass selective herbicides like fluzafop-butyl, but follow-up treatment is needed to control seedlings and surviving plants." |

| Qsn # | Question | Answer |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Bush, T, Ogle, D., St. John. L., Stannard, M., Jensen, K. (eds.) (2012). Plant Guide for Orchardgrass (<i>Dactylis glomerata</i>). USDA-Natural Resources Conservation Service, Aberdeen Plant Materials Center. Aberdeen, ID | "If the area has a large number of plants, chemical control will be most efficient. A nonselective herbicide can be spot applied (which will also kill the desired turf species). Then the area can be reseeded or resodded 5-7 days later (Johnson, 2008)." |
| | Alaska Exotic Plant Management Team. 2015. Invasive Plant Species in Alaska. http://www.nps.gov/akso/natres/epmt/ . [Accessed 31 Jul 2015] | "Numerous herbicides provide effective control for orchard grass but are not specific to it." |

| 804 | Tolerates, or benefits from, mutilation, cultivation, or fire | y |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | Sullivan, J. 1992. <i>Dactylis glomerata</i> . In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. http://www.fs.fed.us/database/feis/ . [Accessed 31 Jul 2015] | "Orchardgrass is reported to increase or remain stable after burning" |
| | Alaska Exotic Plant Management Team. 2015. Invasive Plant Species in Alaska. http://www.nps.gov/akso/natres/epmt/ . [Accessed 31 Jul 2015] | "Orchardgrass tolerates close mowing and may become a problem in lawns. Since its rootstocks do not spread, pulling out young plants can be an effective control method for small infestations. Generally, mechanical methods will not control orchard grass because it has evolved under cultivation. In some cases, repeated mowing may stimulate tillering." |
| | Weber, E. 2003. Invasive Plant Species of the World. A Reference Guide to Environmental Weeds. CABI Publishing, Wallingford, UK | "Plants can be dug out, the crown must be removed to prevent regrowth. Larger stands are cut before flowering commences. In Britain, heavy grazing during autumn may lead to complete elimination of this grass. Follow up programmes are necessary to treat seedlings." |

| 805 | Effective natural enemies present locally (e.g. introduced biocontrol agents) | n |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Source(s) | Notes |
| | CABI, 2015. <i>Dactylis glomerata</i> . In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc | "Biological Control: Although a few insect species seem to be confined to <i>D. glomerata</i> (Beddows, 1959) there has never been any interest in using any of these for biological control: the species is so long established and so valuable in many places that this would be impractical." |
| | Wagner, W.L., Herbst, D.R. & Sohmer, S.H. 1999. Manual of the flowering plants of Hawaii. Revised edition. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. | [No evidence] "in Hawai'i naturalized and abundant in pastures and along trails and roadsides, 100- 2,290 m, on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i." |

Summary of Risk Traits:

High Risk / Undesirable Traits

- Elevation range exceeds 2000 m, demonstrating environmental versatility
- Grows in temperate & tropical climates
- Widely introduced & naturalized, including Kauai, Oahu, Molokai, Maui, and Hawaii
- Disturbance-adapted environmental weed
- Pollen is allergenic
- Shade-tolerant
- Tolerates many soil types
- Forms dense swards
- Reproduces by seeds
- Self-compatible
- Able to reach maturity in <1 year
- Seeds dispersed by wind, as a contaminant, attached to animals or internally, & intentionally planted
- Prolific seed production (densities unknown)
- Able to resprout after cutting or fire

Low Risk Traits

- Unarmed (no spines, thorns or burrs)
- Highly palatable to grazing animals
- Non-toxic
- Not reported to spread vegetatively
- Does not form a persistent seed bank
- Herbicides may provide effective control