barnyardgrass

Echinochloa crus-galli (L.) P. Beauv.

Synonyms: *Pennisetum crusgalli* (L.) Baumg.
Other common name(s): cockspur, Japanese millet, watergrass, barnyard grass, large barnyard grass
Family: Poaceae

Invasiveness Rank: **Not Ranked** - The invasiveness rank is calculated based on a species' ecological impacts, biological attributes, distribution, and response to control measures. The ranks are scaled from 0 to 100, with 0 representing a plant that poses no threat to native ecosystems and 100 representing a plant that poses a major threat to native ecosystems.

Description

Barnyardgrass is an annual grass that grows from 30 to 200 cm tall with spreading, decumbent or erect stems. Nodes are usually hairless but sometimes the lower nodes are minutely hairy. Sheaths are hairless and without ligules, but the ligule area is occasionally hairy. Leaf blades are up to 65 cm long by 5 to 30 mm wide and usually without hairs, but sometimes with short, stiff hairs course to the touch. Panicle inflorescence is 5 to 25 cm long and with hairs bearing nipple-like projections at the base. Hairs are sometimes longer than the spikelets. Primary branches are 1.5 to 10 cm, erect to spreading and longer branches with short, inconspicuous secondary branches. Axes are rough or course to the touch, sometimes with short, stiff hairs that are up to 5 mm long with bases that resemble small, nipple-like surface projections. Spikelets are 2.5 to 4 mm long by 1.1 to 2.3 mm wide, disarticulating at maturity. Upper glumes are nearly as long as the spikelets. Lower lemma awns grow up to 50 mm long, and awn or no awn variation may be observed from branch to branch or within branches of the same individual plant. Lower paleas are subequal to the lemmas. Upper lemmas are broadly ovate to elliptical in shape, and with a leathery textured portion rounded toward the tip and becoming membranous at the tip. The tip is further differentiated from the leathery portion by a line of minute hairs. Anthers are 0.5 to 1 mm long. Caryopses are 1.3 to 2.2 mm long and 1 to 1.8 mm wide, ovoid to oblong in shape, and brownish in color (Michael, 2021, CABI 2017).

Figure 1 Barnyardgrass panicle (Echinochloa crus-galli). Photo by Howard F. Schwartz.

Similar Species: Barnyardgrass may be mistaken for American sloughgrass (*Beckmannia syzigachne).* American sloughgrass has a membranous ligule and spikelets are inflated and awnless, where barnyardgrass is without a ligule, spikelets are not inflated and can have conspicuous awns (Skinner 2012). No other cockspur grass species (*Echinochloa spp*), native or non-native, currently occur in Alaska (AKEPIC 2025, CPNWH 2025, Hultén 1968).

Last Updated: 2025-12-08 Colette Martinez

Figure 2 Barnyardgrass, vegetative. Photo by Howard F. Schulz.

Ecological Impact

Impact on community composition, structure, and interactions: Barnyardgrass has diminished crop yields in agricultural settings by removing nitrogen from the soil and accumulating large amounts of macronutrients at the expense of crop plants (Maun and Barrett 1986).

Figure 3 Barnyardgrass (Echinochloa crus-galli). Photo by Doug Doohan

Impact on ecosystem processes: Known to alter successional processes in freshwater wetlands and floodplains in Australia (Queensland Department of Primary Industry and Fisheries 2011). Barnyardgrass has also been shown to release phytotoxins from its roots that inhibit root and shoot elongation of surrounding plants (Xuan et al. 2006)

Biology and Invasive Potential

Reproductive potential: Under idealistic conditions (i.e. mesic soils) barnyardgrass produces large amounts of seed that either germinate or stay viable in the soil for several years (Waterhouse 1993). Barnyardgrass is capable of flowering over a wide range of photoperiods and will respond to shorter photoperiods by quickly flowering (Holm et al. 1991). Reproduction is exclusively via seed as opposed to vegetative reproduction (Maun and Barrett, 1986). Productive barnyardgrass plants can average 100,000 seeds per plant (Norris 1992).

Role of disturbance in establishment: Banyard grass commonly grows in disturbed habitats and is an early colonizer of disturbed wetlands (Maun and Barrett 1986, Queensland Department of Primary Industry and Fisheries 2011).

Potential for long-distance dispersal: Long-distance dispersal by waterways and birds is likely (Maun and Barrett 1986).

Potential to be spread by human activity: Known anthropogenic vectors of transportation for barnyard grass include debris and waste, livestock, machinery and equipment, soil/sand/gravel transportation, and waders from rice field workers (Maun and Barrett 1986, Waterhouse 1993).

Germination requirement: Barnyardgrass seeds can germinate in oxygen-free conditions of deep water (Kennedy et al. 1980). The large temperature range of 55 to 104°F is tolerable for seedling germination. A pH range of 4.7 to 8.3 is tolerable for seedling germination. The most effective methods of overcoming dormancy in barnyardgrass are scarification, freezing/thawing, and exposing moist seeds to warm temperatures (Maun and Barrett 1986).

Growth requirements: Barnyardgrass seedlings can survive and grow in oxygen-free environments (Kennedy et al. 1980). Barnyardgrass grows well in soil with high water-holding capacity and high nutrient

availability. Flowering will occur over a wide range of photoperiodic conditions (Maun and Barrett 1986).

Legal Listings

- Listed noxious by other states (AR)

Distribution and Abundance

Native and current distribution: The exact nativity of barnyardgrass remains obscure, but it's likely originating from temperate Asia (USDA, ARS 2017). This species establishes in waterways, swamps, wetlands and other wet places. It may also tolerate drier soils and infest disturbed habitats such as agricultural areas, roadsides, and waste places. (Maun and Barrett 1986, Queensland Department of Primary Industry and Fisheries 2011). Barnyardgrass has been reported in Fairbanks, Alaska (AKEPIC 2025, CPNWH 2025). It is known in occur in Canada from BC to Newfoundland, and in all the contiguous 48 states (Brouillet et al. 2010+, USDA, NRCS 2025). This species has not been observed in undisturbed areas in Alaska (Densmore et all. 2001, AKEPIC 2025, CPNWH 2025). For the most up-to-date distribution information for Alaska, visit the AKEPIC database.

Management

A variety of selective herbicides are effective in combating barnyardgrass, but most should be applied during the seedling growth stage and are not effective when used on mature plants. Seedling emergence has been shown reduced by shallow, monthly tillage in the spring. Eradication of barnyardgrass has been achieved with crop rotation (Maun and Barrett 1986).

References:

AKEPIC database. Alaska Exotic Plant Information Clearinghouse Database. 2025. Available: http://accs.uaa.alaska.edu/

Brouillet et al. 2010+. *Echinochloa crus-galli* in VASCAN, the Database of Vascular Plants of Canada. https://data.canadensys.net/vascan/name/Echinochloa%20crus-galli

CABI, 2017. *Echinochloa crus-galli* In: Invasive Species Compendium. Wallingford, UK: CAB International. www.cabi.org/isc.

CPNWH (2025) Consortium of Pacific Northwest Herbaria Specimen Database. University of Washington Herbarium. [Accessed December 8, 2025] Available: https://www.pnwherbaria.org/index.php

Densmore, R. V., McKee, P. C., and Roland, C., 2001, Exotic plants in Alaskan National Park units: USGS, Alaska Biological Science Center.: Anchorage, AK., v. Published Report-564195.

Doohan D., Ohio State University/ OARDC, Bugwood.org

Harris, J. G. (2022). Plant identification terminology: an illustrated glossary. 2nd ed. Spring Lake, Utah: Spring Lake Pub.

Hollis, S. and Brummitt, R.K., (1992). World geographical scheme for recording plant distributions. Hunt Institute for Botanical Documentation, Pittsburgh.

Holm LG; Pancho JV; Herberger JP; Plucknett DL, (1991). A Geographic Atlas of World Weeds. Malabar, Florida, USA: Krieger Publishing Company.

Hultén, E. 1968. Flora of Alaska and Neighboring Territories. Stanford University Press, Stanford, CA. 1008 pp.

ITIS. 2025.Integrated Taxonomic Information System (ITIS) on-line database, www.itis.gov, CC0 https://doi.org/10.5066/F7KH0KBK Retrieved [December 08, 2025]

Kennedy, R. A., Barrett, S. C., Zee, D. V., & Rumpho, M. E. (1980). Germination and seedling growth under anaerobic conditions in *Echinochloa crus-galli* (barnyard grass). Plant, Cell & Environment, 3(4), 243-248.

Maun MA; Barrett SCH, 1986. The biology of Canadian weeds. 77. *Echinochloa crus-galli* (L.) Beauv. Canadian Journal of Plant Science, 66(3):739-759.

Michael PW, 2021. *Echinochloa*. Flora of North America vol. 25 [ed. by Barkworth, M. E. \Capels, K. M. \Long, S. \Piepet, M. B.]. http://herbarium.usu.edu/webmanual

Norris, R. (1992). Case History for Weed Competition/Population Ecology: Barnyardgrass (*Echinochloa crus-galli*) in Sugarbeets (Beta vulgaris). Weed Technology, 6(1), 220-227. Retrieved from http://www.jstor.org/stable/3987194

Queensland Department of Primary Industries and Fisheries (2016). *Echinochloa crus-galli.* The University of Queensland and Department of Primary Industries and Fisheries. https://keyserver.lucidcentral.org/weeds/data/media/Html/echinochloa_crusgalli.htm

Skinner, Q. D. (2012). A Field Guide to Alaska Grasses. Education Resources Publishing.

Schwartz H.F., Colorado State University, Bugwood.org

USDA, NRCS. 2025. The PLANTS Database (http://plants.usda.gov). National Plant Data Team, Greensboro, NC 27401-4901 USA.Motheral, S., & Orrock, J. (2010).

Waterhouse DF, 1993. The Major Arthropod Pests and Weeds of Agriculture in Southeast Asia. ACIAR Monograph No. 21. Canberra, Australia: Australian Centre for International Agricultural Research, 141 pp.

Xuan, T.D., Chung, I.M., Kanh, T.D., Shinkichi, T. 2006. Identification of Phytotoxic Substances from Early Growth of Barnyard Grass (*Echinochloa crusgalli*) Root Exudates. Journal of Chemical

Ecology vol. 32 pp 895-906.
https://link.springer.com/article/10.1007/s10886-006-9035-x