charlock mustard

Sinapis arvensis L.

Synonyms: *Brassica arvensis* (L.) Rabenh.*; Brassica kaber* (DC.) L.C. Wheeler; *Brassica kaber var. pinnatifida* (Stokes) L.C. Wheeler; *Brassica kaber var. schkuhriana* (Rchb.) L.C. Wheeler; *Sinapis arvensis ssp. arvensis* L.; *Sinapis arvensis var. orientalis* (L.) W.D.J. Koch & Ziz; *Sinapis arvensis var. schkuhriana* (Rchb.) Hagenb.
Other common name(s): corn mustard, corn-mustard, wild mustard, charlock
Family: Brassicaceae

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

Figure 1 Charlock mustard (Sinapis arvensis). Photo by Mourad Louadfel

Charlock mustard is an annual forb that grows from 20 to 100 cm tall and is either hairless or covered with course stiff hairs. Stems are unbranched or branched, and hairs are retrorse or spreading if present. Basal leaf blades are obovate, oblong, or lanceolate in shape, 4 to 18 cm long by 15 to 50 mm wide, with margins lyrate, pinnatifid or occasionally undivided. Lobes of basal leaves are 1 to 4 per side, sparsely hairy, and with margins of tip and smaller lateral lobes coarsely toothed. Petioles of basal leaves are usually 1 to 4 cm long. Stem leaves have short petioles and margins that are not often divided, but coarsely toothed. Fruiting pedicels are ascending or suberect and 3 to 7 mm long. Flowers have bright yellow petals (9 to 12 mm by 4 to 6 mm), yellow to green sepals (5 to 6 mm by 1 to 1.8 mm), filaments 4 to 6 mm long, and anthers 1.2 to 1.5 mm long. Fruits are siliques, usually 2 to 4.5 cm long by 2.5 to 3.5 mm wide, valvular segment terete, terminal segment straight or upcurved, shorter than valves, and seedless or 1-seeded. Valves are usually hairless or with short hairs and trichomes of only 1 type. The seeds are reddish-brown to black and 1.5 to 2 mm diameter. Fruit usually contains 4 to 8 seeds per locule (Warwick 2020).

Similar Species: Other species within the mustards (*Brassicaceae*) can be superficially confused with charlock mustard. Charlock mustard can be distinguished from other mustards in Alaska by a comprehensive combination of the following characters: Fruit a silique (length 3x the width), bright yellow petals, all hairs simple (not branched), lower leaves not divided 2-3 times, siliques with stout beaks and globular seeds, beak of silique round and seedless or carrying a single seed and sepals spreading horizontally (Flagstad et al. 2016, Warwick 2020).

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Figure 2. Charlock mustard (Sinapis arvensis) siliques (seed pods). Photo by Joseph M. Ditomaso.

Ecological Impact

Impact on community composition, structure, and interactions: Charlock mustard is one of the most widespread and abundant invasive plant species in North American grain fields (Warwick 2020). It is highly competitive in agricultural environments with major competitive advantages being high seed production, rapid above and belowground growth, and quick germination when exposed to suitable conditions (Fogg 1950). It is frequently visited by pollinating insects and may consequently reduce pollinator visitation to native communities and/or crop plants. Charlock mustard is associated with a variety of insect and fungi pests (Fogg 1950). Seed may cause illness in livestock if ingested in large quantities (Mulligan and Bailey 1975).

Impact on ecosystem processes: Charlock mustard is highly competitive in agricultural and disturbed environments, where it may establish as a dense forb layer. An infestation can drastically reduce nitrogen and potassium availability to co-occurring vegetation (Fogg 1950).

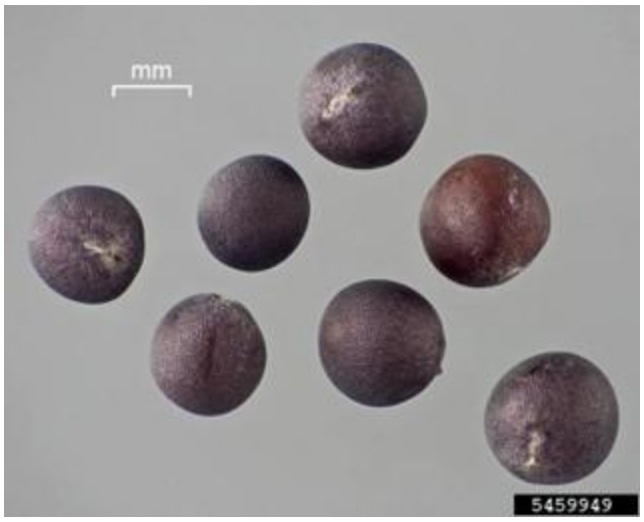

Figure 3 Charlock mustard (Sinapis arvensis) seeds. Photo by D. Walters.

Biology and Invasive Potential

Reproductive potential: Studies have shown a range of average seed production per plant from 590 to 4,000 seeds per plant in agricultural areas. Seed production is greatest when competition is low (Lutman 2002, Mulligan and Bailey 1975, Fogg 1950). Seed can remain viable for up to 11 years in subsurface soil and air-dry conditions (Fogg 1950). Charlock mustard does not exhibit vegetative reproduction (Mulligan and Bailey 1975).

Role of disturbance in establishment: Charlock mustard most commonly establishes in disturbed habitats (Warwick 2020, Mulligan and Bailey 1975).

Potential for long-distance dispersal: Large pods are produced by the plant and split at maturity to release 10 to 18 seeds which do not scatter far from the parent plant. Charlock mustard has no other specialized adaptations for dispersal. Seed may be dispersed by consumption and excretion by birds and other animals (Mulligan and Bailey 1975, Fogg 1950).

Potential to be spread by human activity: Charlock mustard seed is often a contaminant in crop seed and as such may be transported great distances by anthropogenic means (Fogg 1950).

Germination requirement: Charlock mustard

seed primarily germinates in the spring. Literature addressing ideal conditions for germination of charlock mustard seed shows indifference to light but increasing germination in response to soil aeration (Mulligan and Bailey 1975). Ideal temperature for germination was shown to be 70° F, and temperatures below 52° and above 86° F will mostly halt germination. Fluctuating temperature to 41° has also been shown to induce germination.

Growth requirements: Readily killed by frost. Charlock mustard can grow on many soil types but is most competitive when growing in heavy clay soils (Mulligan and Bailey 1975). It is mostly absent from waterlogged soil but was reported growing in peaty agricultural soils (Fogg 1950).

Legal Listings

- Listed noxious in Alaska
- Listed noxious by other states (AZ, IA, MI)

Distribution and Abundance

Native and current distribution: Charlock mustard is native to northern Africa, temperate Asia, tropical Asia, and Europe (USDA, ARS 2017). It commonly establishes on roadsides, waste places, fields, grain fields, orchards, gardens, riverbanks, and other disturbed areas (Warwick 2020, Mulligan and Bailey 1975). Currently known to occur in Interior Alaska and reported from agricultural fields near Delta Junction and near Tanana Hot Springs (AKEPIC 2026, CPNWH 2026). Known to occur in all Canadian provinces apart from Nunavut and all US states except for Alabama (Brouillet et al. 2010+, USDA, NRCS 2026). This species has not been observed in undisturbed areas in Alaska (Densmore et all. 2001) (AKEPIC 2026).
For the most up-to-date distribution information for Alaska, please visit the AKEPIC Database.

Management

Some populations of charlock mustard have developed resistance to auxinic herbicides (Deshpande and Hall 2000). Charlock mustard may be managed effectively with use of selective herbicides such as 2,4-D and MCPA (Mulligan and Bailey 1975). Complete eradication of charlock mustard can only be achieved by persistent treatments year after year. Seeds remain viable for up to 11 years and continued control is crucial to exhausting the seedbank (Fogg 1950).

References:

AKEPIC database. Alaska Exotic Plant Information Clearinghouse Database. 2026. Available: http://accs.uaa.alaska.edu/

Brouillet et al. 2010+. *Sinapis arvensis* in VASCAN, the Database of Vascular Plants of Canada. https://data.canadensys.net/vascan/name/Sinapis%20arvensis [Accessed January 9, 2026] http://nhm2.uio.no/paf/

CPNWH. (2026). Consortium of Pacific Northwest Herbaria Specimen Database. University of Washington Herbarium, Seattle, WA. http://www.pnwherbaria.org [accessed January 9, 2026]

Deshpande, S., & Hall, J. C. (2000). Auxinic herbicide resistance may be modulated at the auxin-binding site in wild mustard (*Sinapis arvensis* L.): a light scattering study. Pesticide Biochemistry and Physiology, 66(1), 41-48.

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.

Ditomaso J.M., University of California – Davis, Bugwood.org

Flagstad, L., J. R. Fulkerson, and H. Cortes-Burns. 2016. Identification of Non-native Plants in Alaska. Alaska Natural Heritage Program, University of Alaska Anchorage. 219 pp.

Fogg, G. E. (1950). *Sinapis Arvensis* L. Journal of Ecology, 38(2), 415-429.

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

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

ITIS. 2026.Integrated Taxonomic Information System (ITIS) on-line database, www.itis.gov, CC0 https://doi.org/10.5066/F7KH0KBK [Accessed January 09, 2026]

Louadfel M., Bugwood.org

Lutman, P. J. W. (2002). Estimation of seed production by *Stellaria media, Sinapis arvensis* and *Tripleurospermum inodorum* in arable crops. Weed Research, 42(5), 359-369.

Mulligan, G. A., & Bailey, L. G. (1975). The Biology Of Canadian Weeds.: 8. *Sinapis arvensis* L. Canadian Journal of Plant Science, 55(1), 171-183.

USDA, NRCS. 2017. The PLANTS Database (http://plants.usda.gov, 7 November 2017). National Plant Data Team, Greensboro, NC 27401-4901 USA.Motheral, S., & Orrock, J. (2010).

Walters D. and Southwick C., USDA, Bugwood.org

Warwick, S.I. *Sinapis arvensis* In: Flora of North America Editorial Committee, eds. 1993+. Flora of North America North of Mexico [Online]. 25+ vols. New York and Oxford. Volume 7 http://floranorthamerica.org/Sinapis_arvensis [Accessed January 9, 2026].