

Plant Propagation Protocol for [*Corydalis aurea* Willd.]

ESRM 412 – Native Plant Production

Protocol URL: [https://courses.washington.edu/esrm412/protocols/\[USDA Species Code.pdf\]](https://courses.washington.edu/esrm412/protocols/[USDA Species Code.pdf])
 (Wilkinson, K.M., T.D. Landis, D.L. Haase, B.F. Daley, and R.K. Dumroese (editors).
 2014. Tropical nursery manual: a guide to starting and operating a nursery for native and
 traditional plants. Agriculture Handbook 732. USDA Forest Service, Washington, DC. 376 p).

TAXONOMY	
Plant Family	Fumariaceae ¹
Scientific Name	<i>Corydalis aurea</i> Willd. ¹
Common Name	scrambled eggs ¹
Species Scientific Name	<i>Corydalis aurea</i> ¹
Scientific Name	<i>Corydalis aurea</i> Willd. ¹
Varieties	n/a
Sub-species	<i>Corydalis aurea</i> subsp. <i>aurea</i> <i>Corydalis aurea</i> subsp. <i>occidentalis</i> ⁵
Cultivar	n/a
Common Synonym(s)	<i>Capnoides aureum</i> (Willd.) Kuntze (CAAU11), <i>Corydalis aurea</i> var. <i>robusta</i> , <i>Corydalis oregana</i> , <i>Corydalis washingtoniana</i> Fedde (COWA5) ¹
Common Name(s)	Scrambled eggs, golden smoke, golden corydalis, ² golden fumewort ⁶
Species Code (as per USDA Plants database)	COAU2 ¹
GENERAL INFORMATION	
Geographical range	Present throughout Canada, Alaska, and the lower 48. The species is native to the American West, Midwest, and East Coast, but is not present in the South or Southeast. At the state level, <i>Corydalis aurea</i> appears across Northeastern Washington, the Northern tip of the Olympic peninsula, and Eastern Oregon. ²

Ecological distribution	Versatile and widely occurring species across a variety of ecosystem types throughout North America: Various deciduous forests (White/red/jack pine, oak/hickory, elm/ash/cottonwood, maple/beech/birch) and evergreen forests (spruce/fir, Douglas-fir, Ponderosa pine, Lodgepole pine). Southwestern shrubsteppe, Sagebrush and Texas savanna, Chaparral and mountain shrub, Pinyon/Juniper, mountain grasslands and meadows, plains and desert grasslands, prairie, Alpine ecosystems. ²
Climate and elevation range	2,500-11,000 ft (762-2286 m) ³
Local habitat and abundance	<p>Grows on slopes/hillsides, roadsides, washes and seasonal stream beds in moist or dry, loose soil. Appears in riparian zones.²</p> <p>Soil Type: Sandy, sandy loam, medium loam, clay loam, clay.⁴ Ideal in lightweight, moist soil types.⁸</p>
Plant strategy type / successional stage	Successional Status: Obligate Initial Community Species (Pioneer species): appears quickly following ecosystem disturbance, dying within a few years once stability reached. Fire-stimulated seed dispersal and germination. ² Relatively frost-tolerant self seeder. Correlation has been noted between the presence of the species and ant populations. Ants help to disperse seeds further than capable by the parent plant itself. ⁶

Plant characteristics	<p>Raunkiaer Life Form: Hemicryptophyte, Therophyte² Forb/herb¹ Non-tuberous⁶ (unlike other species of <i>Corydalis</i>) Monoecious Winter annual or biennial, new seedlings mature within a year of germination. Reproduces through durable ant⁶ and wind-dispersed seeds viable and dormant for variable terms of time depending on conditions. Insect pollinated.¹¹ Flowers seasonally depending on geographical location: generally May-July in most regions. ² Physical Appearance/Characteristics: <1ft. in height, typically 10-30cm. Leaves: Light to middling green compound leaves with three orders of pinnatifid leaflets and lobes. Leaves alternate with diffused branching at base of plant.¹¹ Flowers: Yellow blooms 3-4in in size with clusters of up to 30 flowers.⁴ Flowers initially erect, later become reflexed, blooms range in color from pale to bright yellow.⁵ Fruit: Capsules loosely spread or pendent, cylindrical in shape.¹¹ Seeds: Very small, 0.2 cm in diameter, black and shiny. ¹¹</p>
-----------------------	--

PROPAGATION DETAILS

Ecotype	Seeds may be harvested from mature plants found growing natively, <i>Corydalis aurea</i> not currently commercially available for purchase. ⁶
Propagation Goal	Plants or seeds
Propagation Method	Seed
Product Type	Propagules (seeds) can be grown in most well-drained container types or in a field setting. ¹⁰
Stock Type	Naturally occurring/growing mature flowering plants
Time to Grow	9-12 months ⁹
Target Specifications	Mature Plant: Fully formed 10-30 cm tall with well formed leafy branches and buds/flowers forming. ¹¹

Propagule Collection Instructions	Seeds are produced naturally in May-June ⁶ Collection: Snip stems containing fruits from mature plants and bag carefully prior to further processing. ¹¹
Propagule Processing/Propagule Characteristics	Manually collected seeds purity dependent on collection method. Seed mass: 1.09 g/1000 seeds ¹¹ Longevity: 6-8 weeks in temperature-controlled storage for short-term planned planting. ¹⁰ Seeds viable for up to 160 years in natural fuelbeds. ¹¹
Pre-Planting Propagule Treatments	Ripe seeds may be planted immediately after collection during mid-late summer. ⁹ Seeds may also be stored for 6-8 weeks in an airtight container at 15-18 degrees C. ¹⁰ Cleaning and preparation: Air dry seeds in paper or Tyvek bags at 15-25 degrees C. Crush dried material and remove unwanted chaff. Sieve to further separate seeds from remaining chaff. ¹¹
Growing Area Preparation / Annual Practices for Perennial Crops	Growing media: Moist, well-drained, lightweight soil or medium. ⁶ May be neutral or lightly alkaline in pH. ¹⁰ Conditions: Semi-shade, retain moist soil. ⁸ A liquid fertilizer is suggested during growing months, with the addition of light compost manure or fertilizer before buds are fully grown. ¹⁰
Establishment Phase Details	To mimic natural growth patterns: surface-sow seeds in container in mid-summer, soon after collection (if using freshly collected seeds) allowing seedling to germinate during autumn and mature during winter months. ⁶ Stored/refrigerated seeds may be planted late summer-autumn to allow for autumn germination. ¹⁰
Length of Establishment Phase	1-3 months (Adapted delayed germination from natural summer seed production time to autumn germination) ⁶
Active Growth Phase	After germination in autumn, seedling will grow slowly and mature in mild winter conditions as a winter annual. When soil temperatures warm in spring mature plants will flower and produce seeds. ⁶ Temperate seasonal conditions required for survival, does not tolerate extreme temperatures (either heat or cold) ¹¹

Length of Active Growth Phase	4-7 months ⁶ When leaves are well-established the seedling may be transplanted into a new container if needed. ¹⁰
Hardening Phase	At the end of the flowering season mature plants may die off (annual) or survive temperate winter conditions to bloom and produce seeds for a second year (biennial).
Length of Hardening Phase	(If applicable) 2-4 months: Summertime following flowering and seed dispersal, before onset of cold weather depending on regional climate. ¹¹
Harvesting, Storage and Shipping	Entire plants may be out planted or saved at nursery to harvest seeds.
Length of Storage	Unknown
Guidelines for Outplanting / Performance on Typical Sites	Mature plants should only be relocated/out-planted during the spring season. Will self-seed in summer and will either die off (annual) or survive one more flowering and seeding season (biennial). New seeds will mature within a year of germination on-site. ⁹
Other Comments	<i>Corydalis aurea</i> is not a commonly propagated or commercialized plant, but will self seed in most garden spaces or designated sites. Potentially poisonous to wildlife and livestock, non-edible. Useful to humans for aesthetic and medicinal purposes. ¹¹
INFORMATION SOURCES	

References

¹Plants Profile for *Corydalis Aurea* (scrambled Eggs). Accessed April 23, 2019. <https://plants.usda.gov/core/profile?symbol=COAU2>.

²"*Corydalis Aurea*." Fire Effects Information System (FEIS) Index of Species Information. Accessed April 23, 2019. <https://www.fs.fed.us/database/feis/plants/forb/coraur/all.html>.

³"*Corydalis Aurea*." SEINet Portal Network - *Corydalis Aurea*. Accessed April 23, 2019. <http://swbiodiversity.org/seinet/taxa/index.php?taxon=475>.

⁴"Plant Database: *Corydalis Aurea*." Lady Bird Johnson Wildflower Center - The University of Texas at Austin. Accessed April 23, 2019. https://www.wildflower.org/plants/result.php?id_plant=coau2.

⁵"*Corydalis Aurea*." *Corydalis Aurea* in Flora of North America @ Efloras.org. Accessed April 23, 2019. http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500427.

⁶Tebbitt, Mark C., Magnus Lidén, and Henrik Zetterlund. *Bleeding Hearts, Corydalis, and Their Relatives*. Portland, Or.: Timber Press, 2008.

⁷Liden, Magnus, and Henrik Zetterlund. *Corydalis (a Gardener's Guide and a Monograph of the Tuberous Species)*. Alpine Garden Society.

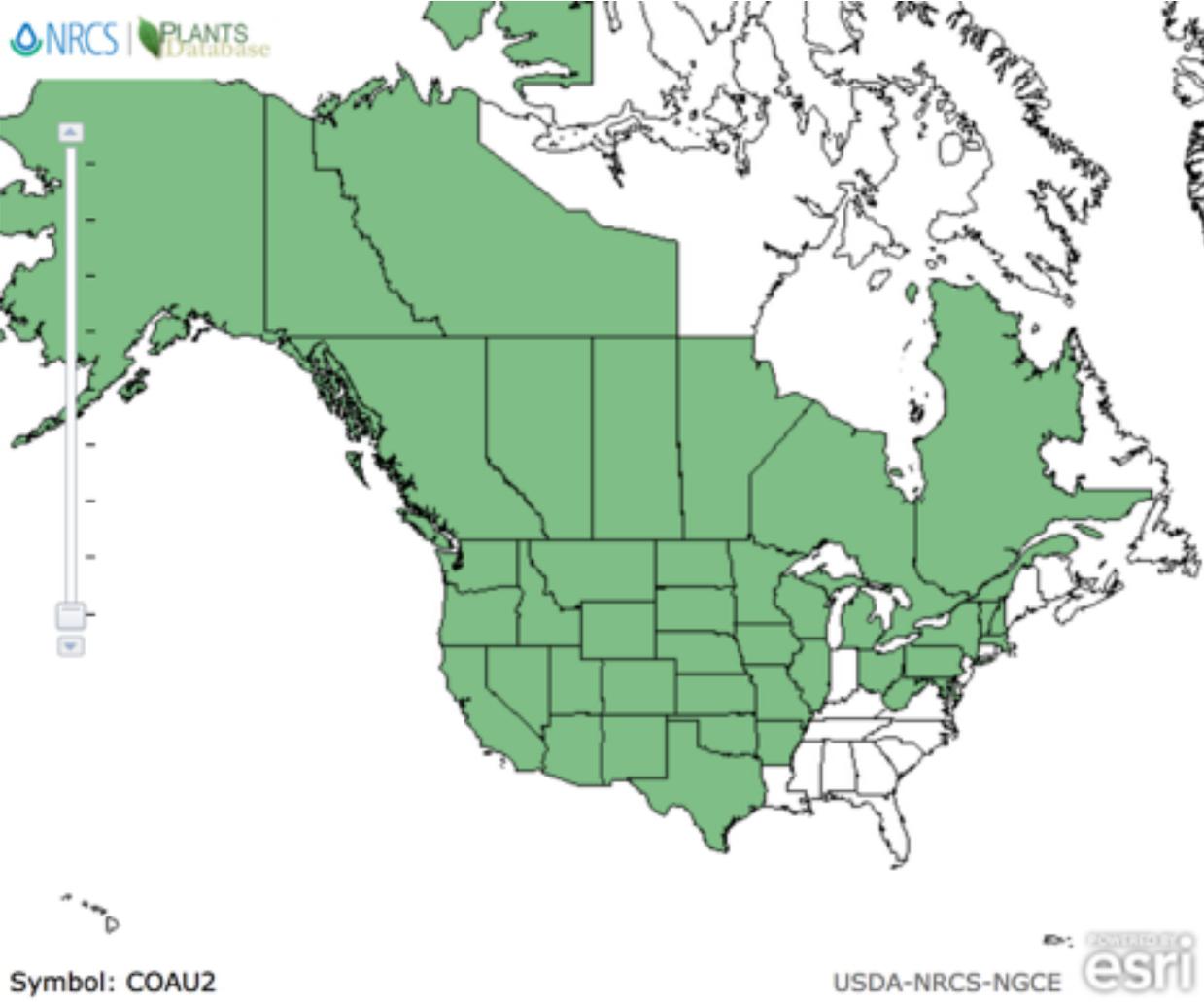
⁸Pfaf Plant Search. Accessed April 29, 2019. [https://pfaf.org/user/Plant.aspx?LatinName=Corydalis aurea](https://pfaf.org/user/Plant.aspx?LatinName=Corydalis+aurea).

⁹Wyman, Donald. *Wymans Gardening Encyclopedia*. New York: Scribner, 1997.

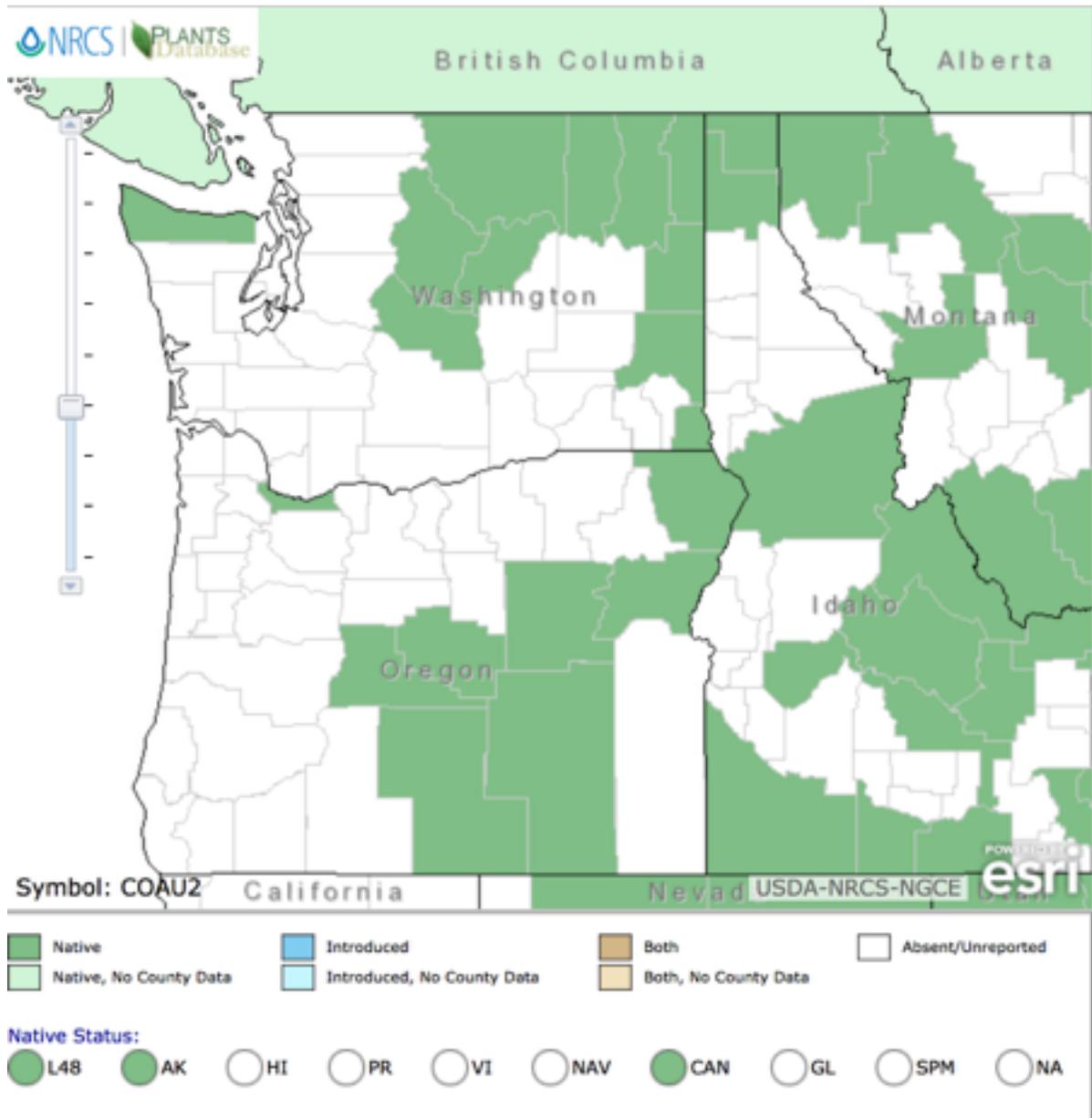
¹⁰"*Corydalis*." *Corydalis Flower Bulbs Worldwide*. Accessed April 29, 2019. <https://www.freeflowerbulbs.com/viewbulb.php?id=106>.

¹¹"*Corydalis Aurea* Willd." Accessed April 29, 2019. <https://acrrre.ualberta.ca/acrrre/wp-content/uploads/sites/>

Other Sources Consulted	<p>Kruckeberg, Arthur R., and Linda Chalker-Scott. Gardening with Native Plants of the Pacific Northwest. Seattle: University of Washington Press, 2019.</p> <p>Rose, Robin, Caryn E. C. Chachulski, and Diane L. Haase. Propagation of Pacific Northwest Native Plants. Corvallis: Oregon State University Press, 1998.</p> <p>Stark, Eileen M. Real Gardens Grow Natives: Design, Plant & Enjoy a Healthy Northwest Garden. Seattle, WA: Skipstone, 2014.</p>
Protocol Author	Sarah Carter
Date Protocol Created or Updated	4/30/19



- Native
- Introduced
- Both
- Absent/Unreported
- Native, No County Data
- Introduced, No County Data
- Both, No County Data



(source for both maps)¹